Adobe® Photoshop® CS2

# Scripting Guide

# Contents

# 1 Introduction

## About this manual

This manual provides an introduction to scripting Adobe® Photoshop CS2® on Mac OS® and Windows®. Chapter one covers the basic conventions used in this manual and provides an overview of requirements for scripting Photoshop CS2.

Chapter two covers the Photoshop CS2 object model as well as generic scripting terminology, concepts and techniques. Code examples are provided in three languages:

- AppleScript
- VBScript
- JavaScript

**Note:** Separate reference manuals are available for each of these languages and accompany this Scripting Guide. The reference manuals are located on the installation CD.

Chapter three covers Photoshop CS2-specific objects and components and describes advanced techniques for scripting the Photoshop CS2 application.

**Note:** Please review the **README** file shipped with Photoshop CS2 for late-breaking news, sample scripts, and information about outstanding issues.

### Conventions in this guide

Code and specific language samples appear in monospaced courier font:

```
app.documents.add
```

Several conventions are used when referring to AppleScript, VBScript and JavaScript. Please note the following shortcut notations:

- AS stands for AppleScript
- VBS stands for VBScript
- JS stands for JavaScript

The term "commands" will be used to refer both to commands in AppleScript and methods in VBScript and JavaScript.

When referring to specific properties and commands, this manual follows the AppleScript naming convention for that property and the VBScript and JavaScript names appear in parenthesis. For example:

"The `display dialogs (DisplayDialogs/displayDialogs)` property is part of the Application object."

In this case, `display dialogs` refers to the AppleScript property, `DisplayDialogs` refers to the VBScript property and `displayDialogs` refers to the JavaScript property.

For larger blocks of code, scripting examples are listed on separate lines.

### AS

```
layer 1 of layer set 1 of current document
```

### VBS

```
appRef.ActiveDocument.LayerSets(1).Layers(1)
```

### JS

```
app.activeDocument.layerSets[0].layers[0]
```

Finally, tables are sometimes used to organize lists of values specific to each scripting language.

## What is scripting?

A script is a series of commands that tells Photoshop CS2 to perform a set of specified actions, such as applying different filters to selections in an open document. These actions can be simple and affect only a single object, or they can be complex and affect many objects in a Photoshop CS2 document. The actions can call Photoshop CS2 alone or invoke other applications.

Scripts automate repetitive tasks and are often used as a creative tool to streamline tasks that might be too time consuming to do manually. For example, you could write a script to generate a number of localized versions of a particular image or to gather information about the various color profiles used by a collection of images.

## Why use scripting?

While graphic design is characterized by creativity, some aspects of the actual work of illustration and image manipulation are anything but creative. Scripting helps creative professionals save time by automating repetitive production tasks such as resizing or reformatting documents.

Any repetitive task is a good candidate for a script. Once you can identify the steps and conditions involved in performing the task, you're ready to write a script to take care of it.

## Why use scripts instead of Actions?

If you've used Photoshop CS2 Actions, you're already familiar with the enormous benefits of automating repetitive tasks. Scripting allows you to extend those benefits by allowing you to add functionality that is not available for Photoshop CS2 Actions. For example, you can do the following with scripts and not with actions:

- You can add *conditional logic*, so that the script automatically makes "decisions" based on the current situation. For example, you could write a script that decides which color border to add depending on the size of the selected area in an image: "If the selected area is smaller than 2 x 4 inches, add a green border; otherwise add a red border."
- A single script can perform actions that involve multiple applications. For example, depending on the scripting language you are using, you could target both Photoshop CS2 and another Adobe Creative Suite 2 Application, such as Illustrator® CS2, in the same script.
- You can open, save, and rename files using scripts.

- You can copy scripts from one computer to another. If you were using an Action and then switched computers, you'd have to recreate the Action.
- Scripts provide more versatility for automatically opening files. When opening a file in an action, you must hard code the file location. In a script, you can use variables for file paths.

**Note:** See Photoshop CS2 Help for more information on Photoshop CS2 Actions.

## System requirements

Any system that runs Photoshop CS2 supports scripting.

### Mac OS

You can create AppleScripts or JavaScripts for use with Photoshop CS2 on a Macintosh system.

#### AppleScript Requirements

You can create AppleScripts on a Macintosh using the Script Editor application, which is installed as part of your Mac OS in the Applications/AppleScript folder. If Script Editor is not on your system, you can install it from your original system software CD-ROM.

You also need AppleScript, which is installed automatically with the OS. If for any reason AppleScript technology has not been installed on your system, you can install it as well from your system software CD-ROM.

**Note:** As your scripts become more complex, you may want to add debugging and productivity features not found in the Script Editor. There are many third-party script editors that can write and debug Apple Scripts. For details, check http://www.apple.com/applescript.

For more information on the AppleScript scripting environment, see 'Viewing Photoshop CS2's AppleScript Dictionary' on page 36.

This manual uses the Script Editor from Apple for creating AppleScripts. For more information on using Script Editor, see 'Creating and Running an AppleScript' on page 22.

#### JavaScript Requirements (Mac OS)

You can create JavaScripts using any text editor that allows you to save your scripts in a text format with a `.jsx` extension.

The editor applications that are part of a default Apple OS installation, Script Editor and TextEdit, do not allow you to create and save JavaScript files. However, your Mac OS installation CD includes the Developer application Project Builder, which you can use to create JavaScripts.

### Windows

You can create VBScript scripts on a Windows platform using any text editor that allows you to save your scripts in a text format with a `.vbs` extension.

For more information, see 'Creating and Running a VBScript' on page 23.

### JavaScript

You can write JavaScripts on either the Mac OS or Windows platform using any text editor. You must save JavaScript files as text files with a `.jsx` extension.

For more information, see 'Creating and Running a JavaScript' on page 24.

## Choosing a scripting language

Your choice of scripting language is determined by two trade-offs:

1. Do you need to run the same script on both Macintosh and Windows computers?

   If yes, you must create a JavaScript. See 'Cross-platform scripts' on page 4.

2. Does the task you are scripting involve multiple applications (such as Photoshop CS2 and Illustrator CS2 or a database program)?

   If yes, you must create an AppleScript if you are using a Macintosh; you must create a VBScript script if you are using Windows. See 'Scripts that control multiple applications' on page 5.

**Tip:** You can combine JavaScript's versatility with the platform-specific advantages of using either AppleScript or VBScript by executing JavaScripts from your AppleScripts or VBScript scripts. See 'Executing JavaScripts from AS or VBS' on page 31 for more information.

**Note:** You can use other scripting languages, although they are not documented in this manual.

- On Mac OS, you can use any language that allows you to send Apple events.
- On Windows, you can use any OLE Automation-aware language.

#### Legacy OLE Automation scripting

Photoshop CS2 supports legacy Automation scripting as long as you modify the way that you refer to the Photoshop CS2 `Application` object in your scripts. For example, instead of saying:

```
Set appRef = CreateObject("Photoshop.Application")
```

you must change the above code to read:

```
Set appRef = CreateObject("Photoshop.Application.9.1")
```

No other change is necessary for legacy COM scripts to run under Photoshop CS2.

### Cross-platform scripts

Because JavaScripts performs identically on both Windows and Macintosh computers, it is considered a *cross-platform* scripting language.

You run a JavaScript from within Photoshop CS2 by storing the script in the ...Presets\Scripts folder of your Photoshop CS2 installation and then selecting the script from the File > Scripts menu.

Running JavaScripts from within Photoshop CS2 eliminates the scripts' facility to directly address other applications. For example, you cannot easily write a JavaScript to manage a workflow that involves Photoshop CS2 and a database management program.

### Scripts that control multiple applications

You can write scripts in either AppleScript or VBScript that control multiple applications. For example, on a Macintosh you can write an AppleScript that first manipulates a bitmap in Photoshop and then commands a web design application to incorporate it. You can write a script with similar capability on Windows using VBScript as the scripting language.

## New Features

The scripting interface now allows you to do any of the following:

- Specify Camera Raw options when opening a document.
- Optimize documents for the Web.
- Create and format contact sheets.
- Specify options for the Batch command.
- Apply the Lens Blur filter.
- Automatically run scripts when specified events occur. For example, using a `notifier` object, you can associate a script with an event such as the Photoshop CS2 application opening, so that the script runs whenever the application opens.

# 2 Scripting basics

This chapter provides a brief introduction to the basic concepts and syntax of the scripting languages AppleScript, VBScript, and JavaScript. If you are new to scripting, you should read this entire chapter.

If you are familiar with scripting or programming languages, you most likely will want to skip many sections in this chapter. Use the following list to locate information that is most relevant to you.

- For more information on Photoshop CS2's object model, see `'Photoshop CS2's Object Model' on page 8`.
- For information on selecting a scripting language, see `'Choosing a scripting language' on page 4`.
- For examples of scripts created specifically for use with Photoshop CS2, see Chapter 3, `'Scripting Photoshop CS2' on page 36`.
- For detailed information on Photoshop CS2 objects and commands/methods, please refer to the following publications, which are located on the installation CD in the same directory as this Guide:
    - *Adobe Photoshop CS2 AppleScript Scripting Reference*
    - *Adobe Photoshop CS2 Visual Basic Scripting Reference*
    - *Adobe Photoshop CS2 JavaScript Scripting Reference*

## Introducing Objects

A script is a series of commands that tell Photoshop CS2 what to do. Basically, the commands manipulate objects.

What are objects in the context of a scripting language? When you use Photoshop CS2, you create documents, layers, channels, and design elements, and you can work with a specific area of an image by selecting the area. These things are objects. The Photoshop CS2 application is also an object.

Each type of object has its own properties and commands (AppleScript) or methods (VBScript and JavaScript).

Properties describe or characterize the object. For example:

- A layer object has a background color. It can also have a text item.
- A channel object has color properties such as red, green, and blue.
- The selected area of an image, or *selection object*, has size and shape properties.

Commands and methods describe actions you want to take on the object. For example, to print a document, you use the `Document` object's `print/PrintOut/print()` command/method.

**Note:** For more detailed information on commands and methods, see `'Using Commands and Methods' on page 12`.

When you write a script to manipulate an object, you can use only the properties and commands or methods defined for that object. For example, a Channel object does not, obviously, have a `print/PrintOut/print()` command/method.

How do you know which properties or commands/methods you can use? Adobe provides all the information you need in the following references, which are available on the installation CD:

- *Adobe Photoshop CS2 AppleScript Scripting Reference*

- *Adobe Photoshop CS2 Visual Basic Scripting Reference*
- *Adobe Photoshop CS2 JavaScript Scripting Reference*

**Tip:** Throughout this guide, explanations of how to create a script for a task are followed by instructions for looking up in the appropriate scripting reference the specific elements used in the script. Using these instructions will help you quickly understand how to script Photoshop CS2.

## Writing Script Statements

A scripting language, like human languages, uses sentences or *statements*, for communication. To write a script statement:

- Name an object.
- Name the property you want to change or create.
- Indicate the task you want to perform on the object's property. In AppleScript, you use a *command*. In VBScript and JavaScript, you use a *method*.

For example, to create a new document called *myDocument*, you would write a script statement that says

```
Add a document called myDocument
```

In this example, the object is *document*, its "name" property is *myDocument*, and the command or method is *add*.

### Syntax

Because you use scripting languages to communicate with the your computer, you must follow strict rules that the computer can understand. These rules are called the language's *syntax*.

The syntaxes for AppleScript, VBScript, and JavaScript are different. In this guide, you will learn basic scripting concepts that these languages share. You will also learn some of the syntax that is specific to each language.

## Object Model Concepts

In a script statement, you refer to an object based on where the object is located in an *object model*. An object model is simply an arrangement of objects. The arrangement is called a *containment hierarchy*.

Here's a way to think about object models:

1. You live in a house, which we will think of as your `house` object.
2. The house has rooms, which we will call its `room` objects.
3. Each room has `window` and `door` objects.

Windows can be open or shut. (In other words, a `window` object has an `open` property that indicates whether or not the window is open.)

If you want to write a script that opens a window in your house, you would use the property or command/method that accomplishes the task. But first, you need to identify the window. This is where the object model comes in: you identify the window by stating where it is in the careful arrangement of objects contained in your house.

First of all, the window is contained by the house. But there are lots of windows, so you need to provide more detail, such as the room in the house. Again, there is probably more than one window in each room, so you'd also need to provide the wall that the window is in. Using the house object model, you would identify the window you want to open as "the window on the north wall in the living room in my house".

To get the script to open that window, you'd simply add the command or method for opening it. Thus your scripting statement would look like this:

```
In my house, in the living room, the window on the north wall: open it.
```

Similarly, you could create a script in your house model to change the color of a door to blue. In this case, you might be able to use the `door` object's `color` property instead of a command or method:

```
In my house, in the bedroom, the door to the bathroom: blue.
```

### Containment Hierarchy

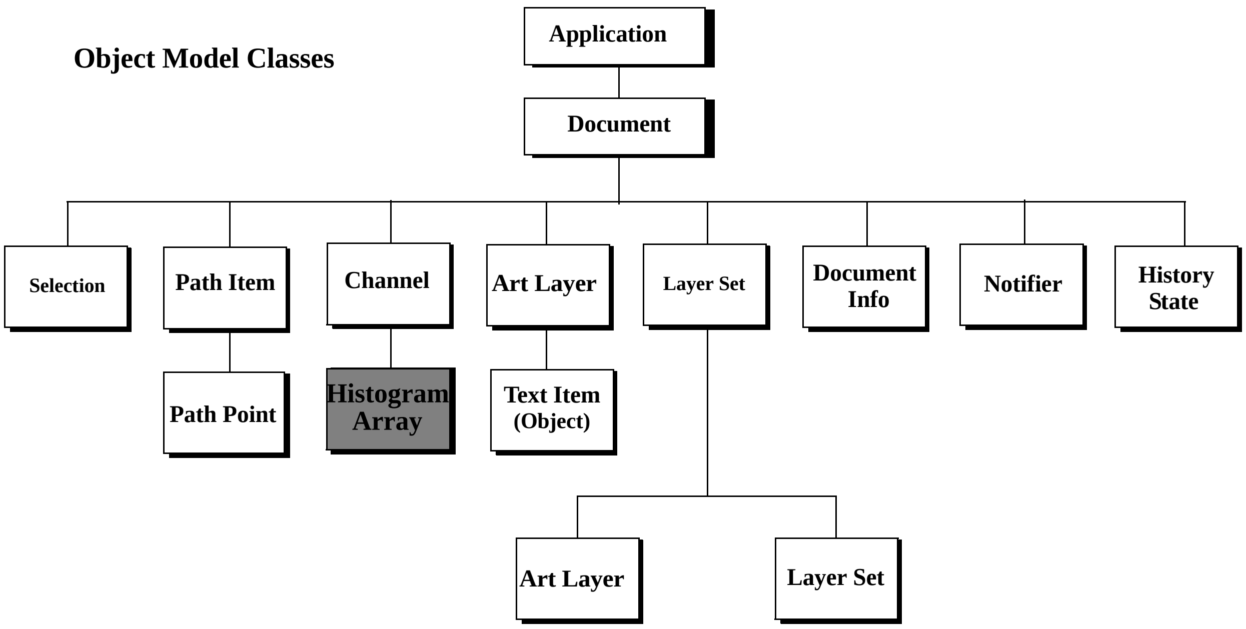
When we refer to an object model as a *containment hierarchy*, we mean that we identify objects in the model partially by the objects that contain them. You can picture the objects in the house model in a hierarchy, similar to a family tree, with the house on top, rooms at the next level, and the windows and doors branching from the rooms.

### Applying the Concept to Photoshop CS2

Now apply this object model concept to Photoshop CS2. The Photoshop CS2 application is the house, its documents are the rooms, and the layers, layersets, channels, and selected areas in your documents are the windows, doors, ceilings, and floors. You can tell Photoshop CS2 documents to add and remove objects or set or change individual object properties like color, size and shape. You can also use commands or methods, such as opening, closing, or saving a file.

## Photoshop CS2's Object Model

To create efficient scripts, you need to understand the containment hierarchy of the Photoshop CS2 object model.



The following table provides information about each object.

| **Object Name** | **Description** | **To create this object without using a script:** |
|---|---|---|
| Application | The Photoshop CS2 application | Start the Photoshop CS2 application. |
| Document | The working object, in which you create layers, channels, actions, and so on. In a script, you name, open, or save a document as you would a file in the application. | In Photoshop CS2, choose **File > New** or **File > Open.** |
| Selection | The selected area of a layer or document. | Choose the marquee or lasso tools and drag your mouse. |
| Path Item | A drawing object, such as the outline of a shape or a straight or curved line | Choose the path selection or pen tools and draw a path with the mouse. |
| Channel | Pixel information about an image's color | Choose **Window > Channels.** |
| Art Layer | A layer class within a document that allows you to work on one element of an image without affecting other elements in the image. | Choose **Layer > New > Layer** or **Window > Layers.** |
| Layer Set | A collection of `Art Layer` objects. | Choose **Layer > New > Layer Set.** |
| Document Info | Metadata about a `Document` object.<br><br>**Note:** Metadata is any data that helps to describe the content or characteristics of a file, such filename, creation date and time, author name, the name of the image stored in the file, etc. | Choose **File > File Info.** |
| Notifier | Notifies a script when an event occurs; the event then triggers the script to execute. For example, when a user clicks an OK button, the notifier object tells the script what to do next. | Choose File > Scripts > Script Events Manager. |
| History State | Stores a version of the document in the state the document was in each time you saved it.<br><br>**Note:** You can use a `History State` object to fill a `Selection` object or to reset the document to a previous state. | Choose **Window > History, and then choose a history state from the History palette.** |

## Object Elements and Collections

When you add an object to your script, the object is included automatically in an object element (AppleScript) or collection (VBScript, JavaScript). The objects in a single element or collection are identical types of objects. For example, each `Channel` object in your script belongs to a `Channels` element or collection; each `Art Layer` object belongs to an `Art Layers` element or collection.

**Note:** Your scripts place objects in elements or collections even when there is only one object of that type in the entire script, that is, only one object in the element or collection.

When you add an object, the object is numbered automatically within its respective element or collection. You can identify the object in other script statements by using its element or collection name and assigned number.

Using the house example, when you add a room to your house, your script stores a number that identifies the room. If it's the first room you've added, your AppleScript considers the room to be *room1*; your VBScript script or JavaScript considers the room to be *room0*.

Here's how the scripting languages handle the automatic numbering if you add a second room:

- AppleScript considers the new room *room1* and renumbers the previously added room so that it becomes *room2*. AppleScript object numbers shift among objects to indicate the object that you worked with most recently. See the AppleScript section in `'Referring to an Object in an Element or Collection' on page 10` for further details on this topic.
- VBScript or JavaScript numbers are static; they don't shift when you add a new object to the collection. Object numbering in VBScript and JavaScript indicates the order in which the objects were added to the script. Because the first room you added was considered *room0*, the next room you add is considered *room1*; if you add a third room, it is labeled *room2*.

When you add an object that is not a room, the numbering starts all over for the new object element or collection. For example, if you add a door, your AppleScript considers the door to be *door1*; your VBScript script or JavaScript considers the door *door0*.

**Note:** You can also name objects when you add them. For example, you can name the rooms *livingRoom* and *bedRoom*. If an object has a name, you can refer to the object in your script either by name or by the element/collection name followed by the assigned number.

Generally, beginning scripters are encouraged to use object names in AppleScript.

In VBScript or JavaScript, you'll find object numbers very useful. For example, you may have several files in which you want to make the background layer white. You can write a script that says "Open all files in this folder and change the first layer's color to white." If you didn't have the capability of referring to the layers by number, you'd need to include in your script the names of all of the background layers in all of the files. Chances are, if you created the files using the Photoshop CS2 application rather than a script, the layers don't even have names.

## Indexes or Indices

An object's number in an element or collection is called an *index*.

## Referring to an Object in an Element or Collection

A collection or element name is the plural version of the object type name. For example, an element or collection of `Document` objects is called *documents*. In JavaScript and VBScript, you can use the collection name and the index to refer to an object. The syntax is slightly different in AppleScript.

The following code samples demonstrate the correct syntax for using an object's index when referring to the object.

**Tip:** Remember that VBScript and JavaScript indices begin with 0. Beginning your count with 0 may seem confusing, but as you learn about scripting, you'll find that using 0 gives you added capabilities for getting your scripts to do what you want.

### AS

In AppleScript, you use the object type name followed by a space and then the index. The following statement refers to the current document. Notice that the element name is implied rather than used explicitly.

```
document 1
```

**Note:** If the element name were used, this statement would be `document 1 of documents`. AppleScript abbreviates the syntax by inferring the element name from the object type name.

In AppleScript, the number that refers to an object in an element changes when the script manipulates other objects. Unless you update the older art layer's status to "active layer", references made to `art layer 1` of current document refer to the new layer.

**Note:** See `'Setting the Active Object' on page 39` for more information about selecting the active layer.

**Tip:** For beginning scripters, it's a good idea to name all objects in your AppleScripts and then refer to the objects by name.

### VBS

In VBScript, you use the collection name followed by the index enclosed in parentheses. There is no space between the collection name and the parentheses.

```
Documents(1)
```

### JS

In JavaScript, the collection name is followed by the index in square brackets with no space between the object name and the brackets.

```
documents[0]
```

## Object References

Because scripts use a containment hierarchy, you can think of an object reference as being similar to the path to a file.

You can use an object's name or index to refer to the object. (See `'Indexes or Indices' on page 10`.)

The following code samples demonstrate the syntax for referring to an `artLayer` object named *Profile*, which was the first layer added to the `layerSet` object named *Silhouettes*, which in turn was the first layer added to the current document:

### AS

Object index reference:

```
layer 1 of layer set 1 of current document
```

Object name reference:

```
layer "Profile" of layer set "Silhouettes" of current document
```

**Note:** When you refer to an object by name, you must enclose the name in double quotes ("").

You can also combine the two types of syntax:

```
layer 1 of layer set "Silhouettes" of current document
```

### VBS

Object index reference:

```
appRef.ActiveDocument.LayerSets(0).Layers(0)
```

Object name reference:

```
appRef.ActiveDocument.LayerSet("Silhouettes").Layer(“Profile”)
```

You can also combine the two types of syntax:

```
appRef.ActiveDocument.LayerSets(1).Layer(“Profile”)
```

**Tip:** Notice that when you refer to an object by its assigned name you use the object classname, which is singular (`LayerSet` or `Layer`). When you use a numeric index to refer to an object, you use the collection name, which is plural (`LayerSets` or `Layers`).

### JS

Object index reference:

```
app.documents[1].layerSets[0].layers[0]
```

Object name reference:

```
appRef.document(“MyDocument”).layerSet("Silhouettes").layer(“Profile”)
```

You can also combine the two types of syntax:

```
appRef.activeDocument.layerSet("Silhouettes").layers[0]
```

**Note:** When you refer to an object by its assigned name you use the object classname, which is singular (`document` or `layerSet` or `layer`). When you use a numeric index to refer to an object, you use the collection name, which is plural (`documents` or `layerSets` or `layers`).

## Using Commands and Methods

Commands (in AppleScript) and methods (in VBScript and JavaScript) are directions you add to a script to perform tasks or obtain results. For example, you could use the `open/Open/open()` command/method to open a specified file.

**Note:** You can use only the methods or commands associated with that object type. For example, you can use the `open/Open/open()` command/method on a `Document` object but not on a `Selection` object which, obviously, cannot be opened.

- Before using a command on an AppleScript object, look up either the object type or the command in the *Adobe Photoshop CS2 AppleScript Scripting Reference* to be sure the association is valid.

  For example, you could look up `open` in the “Commands” chapter of the scripting reference; or you could look up the `Document` object in the “Objects” chapter.

- Before using a method on a VBScript or JavaScript object, look up the method in the Methods table for the object type in the *Adobe Photoshop CS2 Visual Basic Scripting Reference* or the *Adobe Photoshop CS2 JavaScript Scripting Reference*.

  For example, you could look up the `Document` object in the “Interface” chapter, and then find the object’s Methods table.

### Commands and Command Properties

Commands (AppleScript) use normal English sentence syntax. The script statement begins with an imperative verb form followed by a reference to the object upon which you want the script to perform the task. The following AppleScript command prints the first layer of the current document:

```
print layer 1 of current document
```

Some commands require additional data. In AppleScript, the `make new` command adds a new object. You can specify properties for the object by enclosing the properties in brackets and preceding the brackets with the phrase *with properties*. The following statement creates a new document that is four inches wide and two inches high.

```
make new document with properties {width:4 as inches, height:2 as inches}
```

**Note:** See `'Setting the Active Object' on page 39` for information on making sure your script performs the task on the correct object.

## Methods and Arguments

You insert methods at the end of a VBScript or JavaScript statement. You must place a period before the method name to separate it from the rest of the statement.

The following VBScript statement prints the current document:

```
appRef.Documents(1).PrintOut
```

A method in JavaScript must be followed by parentheses, as in the following statement:

```
app.documents[0].print()
```

Some methods require additional data, called *arguments*, within the parentheses. Other methods have optional arguments. The following statements use the `Add/add()` method to add a bitmap document named *myDocument* that is 4000 pixels wide and 5000 pixels tall and has a resolution of 72 pixels per inch:

**Note:** Even though the `Document` object in the following script statements is given a name (*myDocument*), you use the object collection name when you add the object. See `'Referring to an Object in an Element or Collection' on page 10` for more information on object collections. See `'Object References' on page 11` for information on object collection names versus object names in a singular form.

### VBS

```
appRef.Documents.Add(4000, 5000, 72, "myDocument", 5)
```

**Note:** The enumerated value `5` at the end of the script statement indicates the value `psNewBitmap` for the constant `PsNewDocumentMode`. The *Adobe Photoshop CS2 Visual Basic Scripting Reference* contains detailed information about enumerated values and constants.

### JS

```
app.documents.add(4000, 5000, 72, "myDocument", DocumentMode.BITMAP)
```

## Using Variables

A variable is a container for data you use in your script. For example, in the following AppleScript statements the variables `docWidth` and `docHeight` replace the width and height specifications for the new document.

- Without variables:

  ```
  make new document with properties {width:4 as inches, height:2 as inches}
  ```

- With variables:

  ```
  set docWidth to 4 inches
  set docHeight to 2 inches
  make new document with properties {docWidth, docHeight}
  ```

### Why Use Variables?

There are several reasons for using variables rather than entering values directly in the script.

- Variables make your script easier to update or change. For example, if your script creates several 4 x 2 inch documents and later you want to change the documents' size to 4 x 3 inches, you could simply change the value of the variable `docHeight` from *2* to *3* at the beginning of your script and the entire script would be updated automatically.

  If you had used the direct value *2 inches* to enter the height for each new document, updating the document sizes would be much more tedious. You would need find and change each statement throughout the script that creates a document.
- Variables make your scripts reusable in a wider variety of situations. As a script executes, it can assign data to the variables that reflect the state of the current document and selection, and then make decisions based on the content of the variables.

### Data Contained in Variables

The data that a variable contains is the variable's *value*. To assign a value to a variable, you use an *assignment statement*. A variable's value can be a number, a *string* (a word or phrase or other list of characters enclosed in quotes), an object reference, a mathematical expression, another variable, or a list (including collections, elements, and arrays).

See 'Using Operators' on page 25 for information on using mathematical expressions or other variables as values. See 'Using Object Properties' on page 18 for information about arrays.

Assignment statements require specific syntax in each scripting language. See 'Creating Variables and Assigning Values' on page 14 for details.

## Creating Variables and Assigning Values

This section demonstrates how to create two variables named *thisNumber* and *thisString*, and then assign the following values:

| **Variable** | **Value** |
|---|---|
| `thisNumber` | 10 |
| `thisString` | "Hello World" |

**Note:** When you assign a string value to a variable, you must enclose the value in straight, double quotes (""). The quotes tell the script to use the value as it appears without interpreting or processing it. For example, 2 is a number value; "2" is a string value. The script can add, subtract, or perform other operations with a number value. It can only display a string value.

### AS

In AppleScript, you must both create and assign a value to a variable in a single statement. You can create a variable using either the `set` command or the `copy` command.

With the `set` command, you list the variable name (called an *identifier* in AppleScript) first and the value second, as in the following example:

```
set thisNumber to 10
set thisString to "Hello, World"
```

With the `copy` command, you list the value first and the identifier second.

```
copy 10 to thisNumber
copy "Hello World" to thisString
```

### Using the Variable in a Script

After declaring and assigning values to your variables, you use the variables in your script to represent the value; you use only the variable name without the `set` or `copy` command. The following statement uses the `display dialog` command to create a dialog box with the text *Hello World*.

```
display dialog thisString
```

### Assigning an Object Reference as a Value

You can also use variables to store references to objects. (See 'Object References' on page 11 for an explanation of object references.) The following statement creates a variable named `thisLayer` and as its value, creates a new `Art Layer` object. When you use `thisLayer` in a script statement, you are referring to the new layer.

```
set thisLayer to make new art layer in current document
```

You can also assign a reference to an existing object as the value:

```
set thisLayer to art layer 1 of current document
```

### AppleScript Value Types

You can use the following types of values for variables in your AppleScripts.

**Note:** For now, don't worry about the value types you don't understand.

| Value Type | What It Is | Sample Value |
|---|---|---|
| `boolean` | Logical true or false. | true |
| `integer` | Whole numbers (no decimal points). Integers can be positive or negative. | 14 |
| `real` | A number that may contain a decimal point. | 13.9972 |
| `string` | A series of text characters.<br><br>**Note:** Strings appear inside (straight) quotation marks. | "I am a string" |
| `list` | An ordered list of values. The values of a list may be any type. | {10.0, 20.0, 30.0, 40.0} |
| `object` | A specific reference to an object. | current document |
| `record` | An unordered list of properties, Each property is identified by its label. | {name: "you", index: 1} |

## VBS

To create a variable in VBScript, you use the `Dim` keyword at the beginning of the statement. The following statements create the variables `thisNumber` and `thisString`.

```
Dim thisNumber
Dim thisString
```

You can declare multiple variables in a single `Dim` statement by separating the variables with a comma (,), as follows:

```
Dim thisNumber, thisString
```

To assign a value to a variable, you use the equals sign (=), as follows:

```
thisNumber = 10
thisString = "Hello, World"
```

**Note:** Remember to enclose string values in straight, double quotes ("").

Another rule of thumb for proper scripting in VBScript is to declare all of your variables somewhere near the beginning of the script. That way you can easily see which variables are in use without having to search throughout the script for them.

The VBScript tool `Option Explicit` forces you to declare all variables before you use them in a script statement. It also helps you avoid situations in which you try to use a misspelled variable name or an undeclared variable. You use `Option Explicit` before you declare any variables, as in the following code sample:

```
Option Explicit
Dim thisNumber
Dim thisString
thisNumber = 10
thisString = "Hello, World"
```

### Assigning an Object Reference as a Value

You assign an object reference as the value of a variable, use the `Set` command as well as the equal sign. The following example uses `Set` and the `Add` method to create the variable `thisLayer`, create a new `Art Layer` object, and then assign the new `Art Layer` object as the value of `thisLayer`:

```
Dim thisLayer
Set thisLayer = AppRef.Documents(0).ArtLayers.Add
```

The next example uses `Set` to assign an existing `Art Layer` object (in this case, the third **`Art Layer`** object added to the script) as the value of `thisLayer`:

```
Dim thisLayer
Set thisLayer =AppRef.Documents(0).ArtLayers(2)
```

### Using the Variable in a Script Statement

When you use variables in your script to represent values, you use only the variable name without the `Dim` or `Set` keyword. The following example rotates the selected section of the **`Art Layer`** object represented by the variable `thisLayer` by 45 degrees:

```
thisLayer.Selection.Rotate(45)
```

### VBScript Value Types

You can use the following types of values for variables in VBScript.

**Note:** For now, don't worry about the value types you don't understand.

| Value Type | What It Is | Example |
|---|---|---|
| `Boolean` | Logical true or false | true<br>false |
| `Empty` | The variable holds no data | myVar = Empty |
| `Error` | Stores an error number | |
| `Null` | The variable holds no valid value (Usually used to test an error condition) | null |
| `Number` | Any number not inside double quotes | 3.7<br>2000 |

| Value Type | What It Is | Example (Continued) |
|---|---|---|
| `Object` | Properties and methods belonging to an object or array | activeDocument<br>Documents(1).ArtLayers(2) |
| `String` | A series of text characters. Strings appear inside (straight) quotation marks | "Hello"<br>"123 Main St."<br>" " |

### JS

The `var` keyword declares (that is, creates) variables in JavaScript. The following example uses separate statements to declare and assign a value to the variable `thisNumber`; the variable `thisString` is assigned and declared in a single statement.

```
var thisNumber
thisNumber = 10
var thisString = "Hello, World"
```

To assign a reference to an object in JavaScript, you use the same syntax as other JavaScript assignment statements:

```
var docRef = app.activeDocument
```

### JavaScript Value Types

You can use the following types of values for variables.

**Note:** For now, don’t worry about the value types you don’t understand.

| Value Type | What It Is | Examples |
|---|---|---|
| `String` | A series of text characters that appear inside (straight) quotation marks | "Hello"<br>"123 Main St."<br>" " |
| `Number` | Any number not inside double quotes | 3.7<br>15000 |
| `Boolean` | Logical true or false | true |
| `Null` | Something that points to nothing | |
| `Object` | Properties and methods belonging to an object or array | activeDocument<br>Documents(1).artLayers(2) |
| `Function` | Value returned by a function | See `‘Using Subroutines, Handlers and Functions’ on page 29`. |
| `Undefined` | Devoid of any value | undefined |

## Naming Variables

It’s a good idea to use descriptive names for your variables—such as `firstPage` or `corporateLogo`, rather than names only you would understand and that you might not recognize when you look at your script a year after you write it, such as x or c. You can also give your variable names a standard prefix so that they'll stand out from the objects, commands, and keywords of your scripting system. For example, you could use the prefix "doc" at the beginning of any variables that contain `Document` objects, or "layer" to identify variables that contain `Art Layer` objects.

- Variable names must be a single word (no spaces). Many people use internal capitalization (such as `myFirstPage`) or underscore characters (`my_first_page`) to create more readable names.
- Variable names cannot begin with a number or contain punctuation or quotation marks.

  You can use underscore characters ( _ ), but not as the first character in the name.
- Variable names in JavaScript and VBScript are case sensitive. `thisString` is not the same as `thisstring` or `ThisString`.

  Variable names in AppleScript are not case sensitive.

## Using Object Properties

Properties describe an object. For example, a `Document` object's height and width properties describe the document's size.

To access and modify a property of an object, you name the object and then name the property. The specific syntax varies by language. The following examples use the kind property of the `ArtLayer` object to make the layer a text layer.

### AS

You can specify properties using `with properties` at the end of the statement and enclosing the properties in brackets ({ }). Within the brackets, you name the property and then type a colon (:) and the property definition after the colon, as in the following sample.

```
make new art layer with properties {kind:text}
```

### VBS

In VBScript, you use an object's property by naming the object, then typing a period (.), and then typing the property. Use the equals sign (=) to set the property value.

```
Set layerRef toArtLayers.Add
layerRef.Kind = 2
```

**Note:** The `Kind` property value, 2, is a constant value. VBScript uses the enumerated constant values rather than the text version of the value. To find constant values, refer to the "Constants' chapter in the appropriate scripting reference. For more information, see 'Understanding and Finding Constants' on page 19.

### JS

In JavaScript, you name the object, type a period (.), and then name the property, using the equals sign (=) to set the property value.

```
var layerRef = artLayers.add()
layerRef.kind = LayerKind.TEXT
```

**Note:** The `kind` property in JavaScript uses a *constant* value indicated by the upper case formatting. In JavaScript, you must use constant values exactly as they appear in the scripting language reference. To find constant values, refer to the "Constants' chapter in the appropriate scripting reference. For more information, see 'Understanding and Finding Constants' on page 19.

## Understanding and Finding Constants

Constants are a type of value that defines a property. Using the example of the `kind` property of an `Art Layer` object, you can define only specific kinds that Photoshop CS2 allows.

In JavaScript, you must use constants exactly as they are defined—with the exact spelling and capitalization. In VBScript, you use a constant's enumerated value.

**Note:** Throughout this document, actual values of enumerations are given using the following format:

```
newLayerRef.Kind = 2 '2 indicates psLayerKind --> 2 (psTextLayer)
```

The ' before the explanation creates a *comment* and prevents the text to the right of the ' from being read by the scripting engine. For more information, see `Documenting Scripts` for more information on comments.

A constant is indicated as a hypertext link in the Value Type column of the Properties table in the scripting language reference. When you click the link, you can view the list of possible values for the property.

For example, look up the `Art Layer` object in the "Interface" chapter of any of the following references on the installation CD:

- *Adobe Photoshop CS2 Visual Basic Scripting Reference*
- *Adobe Photoshop CS2 JavaScript Scripting Reference*

In the Properties table, look up `kind`. The Value Type column for `kind` contains a link. Click the link to view the values you can use to define the `kind` property.

**Note:** Different objects can use the same property with different constant values. The constant values for the `Channel` object's `kind` property are different than the constant values for the `Art Layer` object's `kind` property.

## Understanding Object Classes and Inheritance

In Photoshop CS2, every type of object— document, layer, etc.—belongs to its own class, each with its own set of properties and behaviors.

Object classes may also "inherit," or share, the properties of a parent, or superclass. When a class inherits properties, we call that class a child or subclass of the class from which it inherits properties. In Photoshop CS2, `Art Layer` objects, for example, inherit from the `Layer` class.

Classes can have properties that aren't shared with their superclass. Using an example from our house object, both window objects and door objects might inherit an "opened" property from the parent `Opening` class, but a window could have a `numberOfPanes` property which the `Opening` class could not have.

In Photoshop CS2 for example, `Art Layer` objects have the property `grouped` which is not inherited from the `Layer` class.

When you use the scripting language reference documents included on the installation CD, if you encounter the term *inherited from*, it indicates that the object class you are looking at is a child class of the parent class named in the definition.

## Using Arrays

In VBScript and JavaScript, arrays are similar to collections; however, arrays are not created automatically.

You can think of an array as a list of values for a single variable. For example, the following JavaScript array lists 4 values for the variable `myFiles`:

```
var myFiles = new Array ()
myFiles[0] = "clouds.bmp"
```

```
myFiles[1] = "clouds.gif"
myFiles[2] = "clouds.jpg"
myFiles[3] = "clouds.pdf"
```

Notice that each value is numbered. To use a value in a statement, you must include the number. The following statement opens the file `clouds.gif`:

```
open(myFiles[1])
```

The following sample includes the same statements in VBScript:

```
Dim myFiles (4)
myFiles(0) = "clouds.bmp"
myFiles(1) = "clouds.gif"
myFiles(2) = "clouds.jpg"
myFiles(3) = "clouds.pdf"

appRef.Open myFiles(1)
```

## Documenting Scripts

You can document the details of your script by including *comments* throughout the script. Because of the way they are formatted, comments are ignored by the scripting system as the script executes.

Comments help clarify (to humans, including yourself) what your script does. It is generally considered good programming practice to document each bit of logic in your script.

You use comments to:

- Help you remember the purpose of a section of your script.
- Help you remember to include all the components you planned for your script. Unless you are an experienced programmer, you can review your script by reading through the comments more easily than you can by reading the code.
- Help others understand your script. It's possible that other people in your organization will need to use, update, or debug your script.

### Comment Syntax

You can create the following types of comments:

- Single-line: An entire line is a comment and therefore ignored when your script runs.
- End-of-line: The line begins with executable code, then becomes a comment which is ignored when the script runs.
- Multi-line: An entire block of text, which runs more than a single line in your script, is a comment.

The following sections demonstrate how to format comments in your scripts.

### AS

To enter a single-line or end-of-line comment in an AppleScript, type two hyphens (--) before the comment.

```
-- this is a single-line comment
set thisNumber to 10 --this is an end-of-line comment
```

To include a multi-line comment, start your comment with a left-parenthesis followed by an asterisk ( (* ) and end with an asterisk followed by a right-parenthesis ( *) ), as in the following example.

```
(* this is a
multi-line comment *)
```

**Note:** Generally, your scripts are easier to read if you format all comments as single-line comments because the comment status of the line is indicated at the beginning of the line.

### VBS

In VBScript, enter a single straight quote ( ' ) to the left of the comment.

```
' this is a comment
Dim thisString ' this is an end-of-line comment
```

**Note:** VBScript does not support multi-line comments. To comment out more than one line, begin each line with a single straight quote.

### JS

In JavaScript, use the double forward slash to comment a single or partial line:

```
// This comments until the end of the line
var thisString = "Hello, World" // this comments until the end of the line as well
```

Enclose multi-line comments in the following notation /* */.

```
/* This entire
block of text
is a comment*/
```

**Note:** Generally, your scripts are easier to read if you format all comments as single-line comments because the comment status of the line is indicated at the beginning of the line.

## Using Long Script Lines

In some cases, individual script lines are too long to fit on a single line in your script editor window.

### AS

AppleScript uses the special character (¬) to show that the line continues to the next line.
This continuation character denotes a “soft return” in the script. Press Option-Return to type the character.

### VBS

In VBScript, use a space followed by an underscore ( _).

### JS

JavaScript does not require a line continuation character. When an individual statement is long to fit on a single line, the next line simply wraps to the following line. However, to make your script easier to read, you can use the space bar or Tab to indent the continuation line.

**Note:** You can put more than one JavaScript statement on a single line if you separate the statements with a semicolon ( ; ). However, your scripts are easier to read if you start a new line for each statement. Here is an example of putting two statements on a single line:

```
var thisNumber= 10; var thisString = "Hello, World"
```

## Creating a Sample Hello World Script

It’s time to put the scripting concepts you’ve just learned into practice. Traditionally, the first thing to accomplish in any programming environment is the display of a "Hello World" message.

➤ **Our Hello World scripts will do the following:**

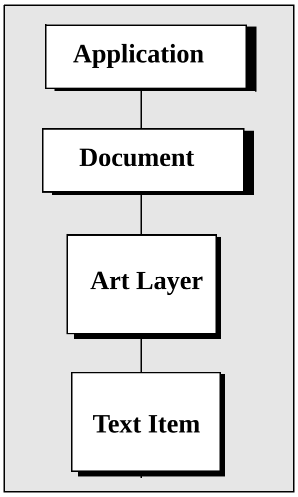
1. Open the Photoshop CS2 application.
2. Create a new `Document` object.

   When we create the document, we will also create a variable named `docRef` and then assign a reference to the document as the value of `docRef`. The document will be 4 inches wide and 2 inches high.
3. Create an `Art Layer` object.

   In our script, we will create a variable named `artLayerRef` and then assign a reference to the `Art Layer` object as the value of `artLayerRef`.
4. Define `artLayerRef` as a text item.
5. Set the contents of the text item to "Hello World".

**Note:** We will also include comments throughout the scripts. In fact, because this is our first script, we will use comments to excess.

These steps mirror a specific path in the containment hierarchy, as illustrated below.



## Creating and Running an AppleScript

You must open Apple's Script Editor application in order to complete this procedure.

**Note:** The default location for the Script Editor is **Applications** > **AppleScript** > **Script Editor**.

➤ **To create and run your first Photoshop CS2 AppleScript:**

1. Enter the following script in the Script Editor:

**Note:** The lines preceded by "--" are comments. Entering the comments is optional.

```
-- Sample script to create a new text item and
-- change its contents.
--target Photoshop CS2
tell application "Adobe Photoshop CS2"

-- Create a new document and art layer.
   set docRef to make new document with properties ¬
       {width:3 as inches, height:2 as inches}
   set artLayerRef to make new art layer in docRef

-- Change the art layer to be a text layer.
   set kind of artLayerRef to text layer

-- Get a reference to the text object and set its contents.
   set contents of text object of artLayerRef to "Hello, World"
end tell
```

2. Click **Run** to run the script. Photoshop CS2 creates a new document, adds a new layer, changes the layer's type to text and sets the text to "Hello, World"

**Note:** If you encounter errors, see 'AppleScript Debugging' on page 32

## Creating and Running a VBScript

Follow these steps to create and run a VBScript that displays the text *Hello World!* in a Photoshop CS2 document.

➤ **To create and run your first Photoshop CS2 VBScript:**

1. Type the following script into a script or text editor.

**Note:** Entering comments is optional.

```
Dim appRef
Set appRef = CreateObject( "Photoshop.Application" )

' Remember current unit settings and then set units to
' the value expected by this script
Dim originalRulerUnits
originalRulerUnits = appRef.Preferences.RulerUnits
appRef.Preferences.RulerUnits = 2

' Create a new 4x4 inch document and assign it to a variable.
Dim docRef
Dim artLayerRef
Dim textItemRef
Set docRef = appRef.Documents.Add(4, 4)

' Create a new art layer containing text
Set artLayerRef = docRef.ArtLayers.Add
artLayerRef.Kind = 2

' Set the contents of the text layer.
Set textItemRef = artLayerRef.TextItem
textItemRef.Contents = "Hello, World!"

' Restore unit setting
appRef.Preferences.RulerUnits = originalRulerUnits
```

2. Save file as a text file with a `.vbs` file name extension.

3. Double-click the file in Windows Explorer to run the script.

   The script opens Photoshop CS2.

## Creating and Running a JavaScript

Follow these steps to create and run a JavaScript that displays the text *Hello World!* in a Photoshop CS2 document.

Because you will be actually using Photoshop CS2 to run your JavaScripts, it is not necessary to include code that opens Photoshop CS2 at the beginning of the script.

**Note:** Adobe has created the Extend Script scripting language to augment JavaScript for use with Photoshop CS2. You can use the Extend Script command `#target` to target the Photoshop CS2 application and create the ability to open JavaScripts that manipulate Photoshop CS2 from anywhere in your file system. See the “Script UI” chapter of the *Adobe Photoshop CS2 JavaScript Scripting Reference* for more information.

➤ **To create and run your first Photoshop CS2 JavaScript:**

1. Type the following script.

   **Note:** Entering comments is optional.

```
// Hello Word Script
// Remember current unit settings and then set units to
// the value expected by this script
var originalUnit = preferences.rulerUnits
preferences.rulerUnits = Units.INCHES

// Create a new 4x4 inch document and assign it to a variable
var docRef = app.documents.add( 4, 4 )

// Create a new art layer containing text
var artLayerRef = docRef.artLayers.add()
artLayerRef.kind = LayerKind.TEXT

// Set the contents of the text layer.
var textItemRef = artLayerRef.textItem
textItemRef.contents = "Hello, World"

// Release references
docRef = null
artLayerRef = null
textItemRef = null

// Restore original ruler unit setting
app.preferences.rulerUnits = originalUnit
```

2. Save file as a text file with a `.jsx` file name extension in the Presets > Scripts folder in your Adobe Photoshop CS2 directory.

   **Note:** You must place your JavaScripts in the Presets > Scripts folder in order to make the scripts accessible from the **File > Scripts** menu in Photoshop CS2. The scripts do not appear on the **File > Scripts** menu until you restart the application.

   **Note:** Photoshop CS2 also supports JavaScript files that use a `.js` extension.

3. Do either of the following:
   - If Photoshop CS2 is already open, choose **File > Scripts > Browse**, and then navigate to the Presets > Scripts folder and choose your script.
   - Start or restart Photoshop CS2, and then choose **File > Scripts**, and then select your script from the **Scripts** menu.

### What's Next

The remainder of this chapter provides information about general scripting tips and techniques. Experienced AppleScript writers and VBScript and JavaScript programmers may want to skip to Chapter 3, `Scripting Photoshop CS2` for specifics on scripting Photoshop CS2.

## Using Operators

Operators perform operations on variables or values and return a result. In the following table, the examples use the following variables:

- `thisNumber =10`
- `thisString = "Pride"`

| Operator | Operation | Example | Result |
|---|---|---|---|
| + | add | `thisNumber` + 2 | 12 |
| - | subtract | `thisNumber` - 2 | 8 |
| * | multiply | `thisNumber` * 2 | 20 |
| / | divide | `thisNumber`/2 | 5 |
| = | assign | `thisNumber` = 10 | 10 |
| + (JS and VBS only) | concatenate[a] | `thisString` + " and Prejudice" | Pride and Prejudice |
| & (AS and VBS only) | concatenate[b] | `thisString` & " and Prejudice" | Pride and Prejudice |

a. Concatenation operations combine two strings. Note that a space has been added at the beginning of the string " and Prejudice"; without the space following the first enclosing quote, the result would be:
Prideand Prejudice

b. See note a.

### Comparison Operators

You can use a different type of operator to perform comparisons such as equal to, not equal to, greater than, or less than. These are called *comparison operators*. Consult a scripting language guide, such as the guides listed in this document's `'Bibliography' on page 34`, for information on comparison operators.

## Using Conditional Statements

Conditional statements give your scripts a way to evaluate something and then act according to the result. For example, you may want your script to detect the blend mode of a layer or the name or date of a history state.

Most conditional statements contain the word `if`, or the words `if` and `then`.

The following examples check whether any documents are open; if no documents are open, the scripts display a dialog box that contains the message “No Photoshop CS2 documents are open!”. If one or more documents are open, then no dialog is displayed.

#### AS

```
tell application "Adobe Photoshop CS2"

   (*create a variable named docCount to contain the document count,
   then use the count command to get the value*)
   set docCount to count every document
   if docCount = 0 then
      display dialog "No Photoshop CS2 documents are open!"
   end if
end tell
```

#### VBS

```
'create a variable named docCount for the document count, open Photoshop
   Dim docCount As long
   Dim appRef As New Photoshop CS2.Application
'use the count property of the Documents collection object to count the number of
open documents
   docCount = appRef.Documents.Count
   If docCount = 0 Then
      Alert "No Photoshop CS2 documents are open!"
   End If
```

#### JS

```
//create a variable named docCount,
//then get its value using
//the length property of the documents (collection) object*/
var docCount = documents.length
if (docCount == 0)
{
   alert("No Photoshop CS2 documents are open!")
}
```

## Loops

Loops are control structures that repeat a process until the script achieves a specific goal, status, or condition.

### Simple Loops

The simplest loops repeat a series of script operations a set number of times. Although you’ll find more substantial uses for loops, the following scripts use a variable named `counter` to demonstrate how to display a dialog box that contains the number 1, then display another dialog that contains the number 2, and then display a third dialog that contains 3.

### AS

```
Set counter to 1
repeat with counter from 1 to 3
   display dialog counter
end repeat
```

### VBS

In VBScript, this type of loop is called a *For-Next* loop.

```
Dim counter As Integer
For counter = 1 to 3
   Alert counter
Next
```

### JS

In JavaScript, this type of loop is called a *for* loop.

**Note:** In the following script, the variable that contains the counter is named *i*. This represents an exception to the rule of thumb for good naming practices for variables. However, *i* is a traditional counter variable name and most script writers recognize its meaning, especially when *i* is used in a loop. See 'Naming Variables' on page 17 for details on variable naming practices.

```
var i
for (i =1; i < 4; i=i + 1)
{
   alert(i)
}
```

The condition in the `for` loop contains three statements (separated by semicolons):

- `i = 1` — Set the value of `i` to 1.
- `i<4` — If `i` is less than 4, execute the statement in brackets; if `i` is equal to or more than 4, stop and don't do anything else with this loop.
- `i=i + 1` — After executing the statement in the brackets, add 1 to the value of `i`.

  **Note:** The equation `i=i + 1` can be abbreviated to `i++`.

## More Complex Loops

A more complicated type of loop includes conditional logic, so that it performs a task while or until some condition is true. Conditional statements in a script can include the words *while*, *until*, or *if* — just like in English.

For example, you could make the conditional statement "I'll use scripts only *if* they make my life easier." Another way to say this is, "I'll use scripts only on the condition that they make my life easier."

Similarly, in the sentence, "I'll write scripts only *while* I'm at work," the condition is *being at work*. The same condition is worded with a slight difference in the following sentence: "I'll write scripts only *until* I leave work."

➤ **The following scripts use while loops to do the following:**

1. Display a "Quit?" dialog.

   The dialog contains two possible responses: an *OK* button and a *Cancel* button.

2. When the user clicks *Cancel* (for "Don't quit."), the script displays the dialog again.

3. When the user clicks *OK* (for "Please quit!"), the script displays a different dialog that asks if the user is sure they want to quit.
4. When the user clicks *Cancel* in the new dialog, they see the second dialog again.
5. When the user clicks *OK*, the loop ends and the dialogs quit appearing.

### AS

```
--create a variable named flag and make its value false
set flag to false

--create the loop and the condition
repeat until flag = true
   --the following assumes that a yes response evaluates to true
   set flag to button returned of (display dialog "Quit?" ¬
        buttons {"OK", "Cancel"}) = "OK"
end repeat

--change the value of flag back to false for the new loop
set flag to false

--create the new loop
repeat while flag = false
   set flag to button returned of (display dialog "Are you sure?" ¬
        buttons {"OK", "Cancel"}) = "Cancel"
end repeat
```

### VBS

```
'create a variable named flag of type Boolean and
'set its value to False
Dim flag As Boolean
flag = False

'create the loop and the condition
Do While flag = False
    retVal = Alert("Quit?", vbOKCancel)
If (retVal = vbCancel) Then
  flag = True
End If
Loop

flag = False
Do Until flag = True
    retVal = Alert("Quit?", vbOKCancel)
    If (retVal = vbOK) Then
        flag = True
    End If
Loop
```

### JS

```
//create a variable named flag and make its value false
var flag = false

//create the loop and the condition
while (flag == false)
```

```
{
   /*create a confirm dialog with the text Quit?
   and two response buttons
   change the value of flag to the selected response*/
   flag = confirm("Quit?")
}

//change the value of flag back to false
var flag = false
do
{
   flag = confirm("Are you sure?")
}
while (flag == false)
```

## Using Subroutines, Handlers and Functions

Subroutines are scripting modules you can refer to from within your script. They allow you to re-use parts of scripts.If you find yourself typing or pasting the same lines of code into several different places in a script, you've identified a good candidate for a subroutine.

**Note:** Subroutines can also be called *handlers*, *functions*, or *routines*; these terms can have slight differences in different scripting languages. In VBScript, a function is a subroutine that returns a value. JavaScript generally uses the term *function*; AppleScript generally uses the term *handler*.

You can pass one or more values to a subroutine or function; you can receive one or more values in return. For example, you could pass a single measurement value (such as inches) to a function and ask the function to return the equivalent value in a different measurement system (such as centimeters). Or you could ask a function to return the geometric center point of an object from its geometric bounds.

The following samples demonstrate simple subroutine syntax, followed by a more complex subroutine example.

### AS

You enclose a handler in the words `on` and `end`.

#### Simple Handler

This sample defines a handler named `helloWorld()` that, when called from a script, displays a dialog with the message *Hello World*.

```
on helloWorld()
   display dialog “Hello World”
end
```

To call the handler, you simply include it in your script.

```
tell Application “Photoshop CS2”
helloWorld()
end tell
```

When the script runs, the handler enacts the statements in the handler definition.

#### Complex Handler

The following script displays a dialog with the message *Are you sure?* and two buttons: *Yes* and *No*.

```
set flag to DoConfirm ("Are you sure?")
display dialog flag as string

'create a handler named DoConfirm
```

```
on DoConfirm(prompt)
   set button to button returned of (display dialog prompt ¬
      buttons {"Yes", "No"} default button 1)
   return button = "Yes"
end DoConfirm
```

## VBS

In VBScript, subroutines begin with the keyword `Sub` and do not return a value. If you would like your subroutine to return a value, you must make it a function. Functions begin with the keyword `Function`.

### Subroutine

The following subroutine, which is named `HelloWorld()`, simply displays a message box with the message *Hello World*.

```
Sub HelloWorld()
Alert "Hello World"
End Sub
```

To call the subroutine, you include it in a script. The following example displays a Hello World message when a user clicks CommandButton1.

```
Private Sub CommandButton1_Click()
HelloWorld
End Sub
```

### Function

The following script presents a form with one command button. When a user clicks the button, a dialog appears with the message *Are you sure?* and two buttons: *Yes* and *No*. When the user clicks a button, another dialog appears that displays the Boolean value of the clicked button: Yes = *True*; No = *False*.

```
'create a subroutine that calls the function DoConfirm
'and assigns it to the variable named Result
Private Sub CommandButton1_Click()
    Result = DoConfirm("Are you sure?")
    Alert Result

End Sub

'define the function
Function DoConfirm(prompt)
    buttonPressed = Alert (prompt, vbYesNo)
    DoConfirm = (buttonPressed = vbYes)
End Function
```

## JS

In JavaScript, all subroutines are functions. The following sample script is a JavaScript version of the VBScript sample function in the previous example.

```
/*create a variable and assign its value as the return value
of the function named DoConfirm*/
var theResult = DoConfirm( "Are you sure?" )

//display an alert box with the assigned value as its message
alert(theResult)

//define DoConfirm
function DoConfirm(message)
{
   var result = confirm(message)
   return result
}
```

## Executing JavaScripts from AS or VBS

You can take advantage of JavaScript's platform-independence by running scripts from AppleScript or VBScript. You can execute either a single JavaScript statement or a complete JavaScript file.

### AS

To run a JavaScript from AppleScript, you use the `do javascript` command.

The following sample executes a single JavaScript command, which displays an alert box with the text *alert text*.

```
do javascript "alert('alert text')"
```

To pass a JavaScript file, you can create a reference to the file using `as alias` or `to a reference to file` as shown in the following examples

```
set scriptFile to "applications: scripts: myscript" as alias
do javascript scriptFile

set scriptFile to a reference to file "applications: scripts: myscript"
do javascript scriptFile
```

**Note:** Refer to an AppleScript language guide or text book for information on referencing a file using either `as alias` or `to a reference to file`.

### VBS

In VBScript, use the `DoJavaScript` method to execute a single JavaScript command.

```
objApp.DoJavaScript ("alert('alert text')")
```

To open a JavaScript file, use the `DoJavaScriptFile` method. The following sample opens a file on the `D:\\` drive.

```
Dim appRef As Photoshop.Application
Set appRef = CreateObject("Photoshop.Application")
appRef.DoJavaScriptFile ("D:\\Scripts\\MosaicTiles.jsx")
```

## Passing AS or VBS Arguments to JavaScript

You can also pass arguments to JavaScript from either AppleScript or VBScript using the `with arguments/(Arguments)` parameter of the `do javascript/DoJavaScript` or `DoJavaScriptFile` command or methods. The parameter takes an array to pass any values.

The following examples execute the following JavaScript, which is stored in a file named `JSFile.jsx` in your Applications\Scripts folder:

```
alert( "You passed " + arguments.length + " arguments" )
for ( i = 0; i < arguments.length; ++i )
{
   alert( arguments[i].toString() )
}
```

### AS

```
tell application "Adobe Photoshop CS2"
   make new document
   do javascript (alias a path to the JavaScript shown above) ¬
      with arguments {1, "test text", (fileApplications:Scripts:JSFile.jsx),¬
      current document}
```

```
end tell
```

### VBS

```
Dim appRef As Photoshop.Application
Set appRef = CreateObject("Photoshop.Application")
appRef.DoJavaScriptFile "C:\\Applications\Scripts\JSFile.jsx", _
   Array(1, "test text", appRef.ActiveDocument)
```

When running JavaScript from AppleScript or VBScript you can also control the debugging state. To do this, use the `show debugger (`*`ExecutionMode`*`)` argument. The values for *ExectionMode* are:

- `NeverShowDebugger` Disables debugging from the JavaScript. Any error that occurs in the JavaScript results in a JavaScript exception being thrown.

  **Note:** Refer to a JavaScript language guide for information on how to handle JavaScript exceptions. See `'Bibliography' on page 34` for a listing of language guides.
- `DebuggerOnError` Automatically stops the execution of your JavaScript when a runtime error occurs and shows the JavaScript debugger.
- `BeforeRunning` Shows the JavaScript debugger at the beginning of your JavaScript.

See `'Testing and Troubleshooting' on page 32` for more information about debugging.

## Testing and Troubleshooting

The AppleScript and VBScript scripting environments provide tools for monitoring the progress of your script while it is running—which makes it easier for you to track down any problems your script might be encountering or causing.

### AppleScript Debugging

Apple's Script Editor application provides a syntax checking tool that you can use before you run your script. Additionally, Script Editor calls out problems in the script when you run the script. To view more details of how your script runs, display the Event Log and Results windows.

➤ **To have Script Editor check your syntax:**

1. Click Check Syntax in the Script Editor main window.

**Note:** It is possible to create and compile scripts in AppleScript that will not run properly. You can double-check your syntax by using the Event Log and when you run your script.

➤ **To use the Event Log window when you run a script:**

1. Choose **Controls** > **Open Event Log**.

   The Script Editor displays the Event Log window.

2. Select **Show Events** and **Show Events Results**.

3. Click **Run** in the Script Editor main window.

   As the script executes, you'll see the commands sent to Photoshop CS2 and the responses.

   **Note:** You can display the contents of one or more variables in the log window by including the `log` command in your script. Specify the variables you want to display in brackets following the command. The following sample requests the display of the variables `myVariable` and `otherVariable`.

```
log {myVariable, otherVariable}
```

➤ **To view results in the Results window rather than the Event Log:**

1. Choose **Controls** > **Show Result**.

**Note:** Third-party editors offer additional debugging features.

## VBScript Debugging

The Windows Script Host cancels your script and displays an error message when you try to run a VBScript that contains faulty syntax or other code errors. The error message names the script and indicates the line in and character position in which it believes the error is located, along with an error description. You can use this information as a guideline. However, often, the syntax error is in the line preceding the error description in the message.

You can trace the execution of your script elements when the script is running by adding MsgBox commands. A MsgBox command stops your script at point where the command has been inserted and displays a dialog with the message you included in the command. The syntax for a message box that displays the message *My Message* is:

```
MsgBox (“My Message”)
```

Check your VBScript documentation for more information. Windows Scripting Host also provides debugging information.

## JavaScript Debugging

JavaScript debugging is described in detail in the *Adobe Photoshop CS2 JavaScript Scripting Reference* on the Photoshop installation CD. Please refer to that document for further information.

## Error Handling

Imagine that you’ve written a script that formats the current text selection. What should the script do if the current selection turns out not to be text at all, but a path item? You can add *error handling* code to your script to respond to conditions other than those you expect it to encounter.

The following example shows how you can stop a script from executing when a specific file cannot be found. This example stores a reference to the document named `MyDocument` in a variable named `docRef`. If a document named `MyDocument` does not exist in the current document, the script displays a message.

### AS

```
—Store a reference to the document with the name "My Document"
—If “My Document” does not exist, display an error message
tell application "Adobe Photoshop CS2"
    try
        set docRef to document "My Document"
        display dialog "Found 'My Document' "

    on error
        display dialog "Couldn't locate document 'My Document'"
    end try
end tell
```

### VBS

```
Private Sub Command1_Click()
' Store a reference to the document with the name "My Document"
' If the document does not exist, display an error message.
    Dim appRef As New Photoshop.Application
    Dim docRef As Photoshop.Document
    Dim errorMessage As String
    Dim docName As String

    docName = "My Document"
    Set docRef = appRef.ActiveDocument
    On Error GoTo DisplayError
        Set docRef = appRef.Documents(docName)
        Alert  "Document Found!"
    Exit Sub
DisplayError:
    errorMessage = "Couldn't locate document " & "'" & docName & "'"
    Alert  errorMessage
End Sub
```

### JS

```
try
{
   for (i = 0; i < app.documents.length; ++i)
   {
      var myName = app.documents[i].name;
      alert(myName)
   }
}
catch(someError)
{
   alert( "JavaScript error occurred. Message = " +
          someError.description)
}
```

## Bibliography

### AS

For further information and instruction in using the AppleScript scripting language, see these documents and resources:

- "AppleScript for the Internet: Visual QuickStart Guide," 1st ed., Ethan Wilde, Peachpit Press, 1998. ISBN 0-201-35359-8.
- "AppleScript Language Guide: English Dialect," 1st ed., Apple Computer, Inc., Addison-Wesley Publishing Co., 1993. ISBN 0-201-40735-3.
- "Danny Goodman's AppleScript Handbook," 2nd ed., Danny Goodman, iUniverse, 1998. ISBN 0-966-55141-9.
- Apple Computer, Inc. AppleScript website:

  www.apple.com/applescript

### VBS

For further information and instruction in using VBScript and the VBSA scripting language, see these documents and resources:

- "Learn to Program with VBScript 6," 1st ed., John Smiley, Active Path, 1998. ISBN 1-902-74500-0.
- "Microsoft VBScript 6.0 Professional," 1st ed., Michael Halvorson, Microsoft Press, 1998. ISBN 1-572-31809-0.
- "VBS & VBSA in a Nutshell," 1st ed., Paul Lomax, O'Reilly, 1998. ISBN 1-56592-358-8.
- Microsoft Developers Network (MSDN) scripting website:

  `msdn.microsoft.com/scripting`

### JS

For further information and instruction in using the JavaScript scripting language, see these documents and resources:

- "JavaScript: The Definitive Guide," David Flanagan, O'Reily Media Inc, 2002. ISBN 0-596-00048-0.
- "JavaScript Bible," Danny Goodman, Hungry Minds Inc, 2001. ISBN 0-7645-4718-6.
- "Adobe Scripting," Chandler McWilliams, Wiley Publishing, Inc., 2003. ISBN 0-7645-2455-0.

# 3 Scripting Photoshop CS2

This chapter demonstrates several techniques for creating scripts to use specifically with Photoshop CS2.

More importantly, you will learn how to use the Photoshop CS2 scripting references to find the objects, classes, properties, commands/methods, and even some values (called *constants* or *enumerations*) you can use to create AppleScripts, VBScript scripts, and JavaScripts for Photoshop CS2.

**Tip:** Throughout this chapter, the explanation of how to create a script is followed by instructions for locating information about the specific elements used in the script. Using these instructions will help you quickly understand how to script Photoshop CS2.

The explanations reference the following publications, which are available on the installation CD:

- *Adobe Photoshop CS2 AppleScript Scripting Reference*
- *Adobe Photoshop CS2 Visual Basic Scripting Reference*
- *Adobe Photoshop CS2 JavaScript Scripting Reference*

## Viewing Photoshop CS2 Objects, Commands and Methods

You can also view the reference data for AppleScript and VBScript within your script editor environment.

**Note:** JavaScript is a cross-platform language and therefore does not require a specific script editor.

### Viewing Photoshop CS2's AppleScript Dictionary

You use Apple's Script Editor application to view the dictionary.

**Note:** The default location for the Script Editor is **Applications > AppleScript > Script Editor**.

➤ **To view the AppleScript dictionary:**

1. In Script Editor, choose **File > Open Dictionary**.

   Script Editor displays an Open Dictionary dialog.

2. Choose Photoshop CS2, and then click **Open**.

   Script Editor opens Photoshop CS2 and then displays the Photoshop CS2 dictionary, which lists objects as well as the commands, properties and elements associated with each object. The dictionary also lists the parameters for each command.

**Note:** The Photoshop CS2 dictionary does not display the complete list of open and save formats. To view the complete lists, look up the following commands in the *Adobe Photoshop CS2 AppleScript Scripting Reference*:

- `open`
- `save`

### Viewing Photoshop CS2's Type Library (VBS)

You can use the VBA editor in Microsoft Word to display the objects and commands available for VBScript in Photoshop CS2.

➤ **To view the VBS object library:**

1. Start Word, and then choose **Tools** > **Macro** > **Visual Basic Editor**.
2. Choose **Tools** > **References**., and then select the Adobe Photoshop CS2 Type Library check box and click **OK**.
3. Choose **View** > **Object Browser**.
4. Choose Photoshop CS2 **type library** from the list of open libraries shown in the top-left pull-down menu.
5. Choose an object class to display more information abut the class.

## Targeting and Referencing the Application Object

Because you run your AppleScript and VBScript scripts from outside the Photoshop CS2 application, the first thing your script should do is indicate that the commands/methods be executed in Photoshop CS2.

**Note:** In JavaScript, you do not need to target the `Application` object because you open the scripts from the Photoshop CS2 application itself. (See `'Creating and Running a JavaScript' on page 24`.)

### AS

To target Photoshop CS2 in AppleScript, you must enclosing your script in the following statements:

```
tell application "Adobe Photoshop CS2"
...
end tell
```

**Note:** Because you include all commands in the `tell` block, there is no need to reference the `Application` object throughout the script.

### VBS

In VBScript, you can do any of the following to target the application:

```
Dim appRef
Set appRef = CreateObject("Photoshop.Application")
```

### JS

In JavaScript, because you do not need to reference an `Application` object, all properties and methods of the application are accessible without any qualification. You can reference the application as part of the containment hierarchy or leave it out, whichever makes your scripts easier for you to read. The following statements are equivalent:

```
var docRef = app.documents[1]
```

and

```
var docRef=documents[1]
```

**Note:** JavaScript samples throughout this guide do not reference the `Application` object.

## Creating New Objects in a Script

To create a new document in the Photoshop CS2 application, you select **File** > **New**. To create other types of objects within a document, such as a layer, channel, or path, you use the Window menu or choose the

*New* icon on the appropriate palette. This section demonstrates how to accomplish these same tasks in a script.

To create an object in a script, you name the type of object you want to create and then use the following command/method:

- AS: `make`
- VBS: `Add`
- JS: `add()`

As you can see in the Photoshop CS2 Object Model, the Document object contains all other objects except the Application object. Therefore, you must reference the `Document` object when adding objects other than `Document` objects to your script.

**Note:** In VBScript and JavaScript, you use the object's collection name to name the object type. For example, you add a document to the `Documents` collection; you add an art layer to the `art layers` collection. See `'Object Elements and Collections' on page 9` for more information.

## AS

The following statement creates a `Document` object in an AppleScript.

```
make new document
```

You can also use the `set` command to create a variable to hold a reference to a new document. In the following example, the variable named `docRef` holds a reference to the new document:

```
set docRef to make new document
```

To create an object other than a document, you must reference the `Document` object that contains the object. The following sample creates an art layer in the document contained in the variable named `docRef`.

```
make new art layer in docRef
```

**Note:** When you create object in AppleScript, you actually add the object to an element the same way you add a VBScript or JavaScript object to a collection. However, in AppleScript, the element name is implied in the `make` or `set` statement. For example, the statement:

```
make new document
```

actually means:

```
make new document in the documents element
```

Do the following to find out more about creating objects in an AppleScript:

- Look up the `make` and `set` commands in the "Commands" chapter in the *Adobe Photoshop CS2 AppleScript Scripting Reference*.
- To find out which commands can be used with an object, look up the object or the object's element name in the "Objects" chapter in the *Adobe Photoshop CS2 AppleScript Scripting Reference* and check the Valid Commands list. For example, look up "document" or "documents" to learn which commands can be used with `Document` objects.

## VBS

In VBScript, you can use the `Add` method *only* with the collection name. The `Add` method is not valid with objects other than collection objects. Also, in VBScript, you must reference the `Application` object when creating when creating, or referring to, an object in your script.

For example, to create a document in a VBScript script, you *cannot* use the object name, as in the following sample, which creates a `Document` object:

```
appRef.Document.Add()
```

You must use the collection name, which is a plural form of the object name, as follows:

```
appRef.Documents.Add()
```

**Note:** In this sample statement, the `Application` object is referenced via a variable named `appRef`. See `'Targeting and Referencing the Application Object' on page 37` for more information.

To add an `ArtLayer` object, you must reference both the `Application` and `Document` objects that will contain the art layer. The following sample references the `Application` object using the variable `appRef` and the `Document` object using the documents index rather than the `Document` object's name.

```
appRef.Documents(0).ArtLayers.Add()
```

If you look up in the `Document` object in the *Adobe Photoshop CS2 Visual Basic Scripting Reference*, you will see that there is no `Add()` method in the object's Methods table. However, the `Add()` method is available for the `Documents` object. Similarly, the `ArtLayer` object does not have an `Add()` method; the `ArtLayers` object does.

**Note:** The `Layers` object is an exception because, although it is a collection object, it does not include an `Add()` method. The `Layers` collection includes both `ArtLayer` and `LayerSet` objects. For more information, look up the `Layers` object in the scripting reference.

### JS

In JavaScript, you can use the `add()` method only with the collection name. The `add()` method is not valid with objects other than collection objects.

Similar to VBScript, the JavaScript statement to create a document is:

```
documents.add()
```

and *not*:

```
document.add()
```

**Note:** You can include an `Application` object reference if you wish. The following statement is equivalent to the previous sample:

```
app.documents.add()
```

To add an `ArtLayer` object, you must reference the `Document` object that will contain the layer.

```
documents(0).artLayers.add()
```

The `add()` method is associated with the JavaScript `Documents` object but not with the `Document` object (refer to the *Adobe Photoshop CS2 JavaScript Scripting Reference*).

Similarly, the `ArtLayer` object does not have an `add()` method; the `ArtLayers` object does.

**Note:** The `Layers` collection object does not include an `add()` method. For more information, look up the `Layers` object in the *Adobe Photoshop CS2 JavaScript Scripting Reference*.

## Setting the Active Object

To work on a an object in the Photoshop CS2 application, you must make the object the front-most, or *active* object. For example, to work in a layer, you must first bring the layer to the front.

In scripting, the same rule applies. If your script creates two or more documents, the commands and methods in your script are executed on the active document. Therefore, to ensure that your commands are acting on the correct document, it is good programming practice to designate the active document before executing any commands or methods in the script.

To set an active object, do the following:

- In AppleScript, you use the `current` property of the parent object.

- In VBScript, you use the `Active`*`Object`* property of the parent object (such as `ActiveDocument` or `ActiveLayer`).
- In JavaScript, you use the `active`*`Object`* property of the parent object (such as `activeDocument` or `activeLayer`).

**Note:** The parent object is the object that contains the specified object. For example, the application is the parent of the document; a document is the parent of a layer, selection, or channel.

For example, if you search for `activeDocument` in the *Adobe Photoshop CS2 JavaScript Scripting Reference*,you will find it is a property of the `Application` object; if you search for `activeLayer` or `activeHistoryState`, you will find they are properties of the `Document` object. Similarly, if you search for `current` document in the *Adobe Photoshop CS2 AppleScript Scripting Reference*, you will find it is a property of the `Class application`, and so on.

For sample scripts that set active objects, see the following sections.

- `'Setting the Active Document' on page 40`
- `'Setting the Active Layer' on page 41`
- `'Setting the Active Channels' on page 41`

## Setting the Active Document

The following examples demonstrate how to set the active document.

### AS

```
--create 2 documents
set docRef to make new document with properties ¬
   {width:4 as inches, height:4 as inches}
set otherDocRef to make new document with properties¬
   {width:4 as inches, height:6 as inches}

--make docRef the active document
set current document to docRef
--here you would include command statements
--that perform actions on the active document. Then, you could
--make a different document the active document

--use the current document property of the application class to
--bring otherDocRef front-most as the new active document
set current document to otherDocRef
```

### VBS

```
'Create 2 documents
Set docRef = app.Documents.Add ( 4, 4)
Set otherDocRef = app.Documents.Add (4,6)

'make docRef the active document
Set app.activeDocument = docRef
'here you would include command statements
'that perform actions on the active document. Then, you could
'make a different document the active document

'use the ActiveDocument property of the Application object to
'bring otherDocRef front-most as the new active document
Set app.ActiveDocument = otherDocRef
```

### JS

```
// Create 2 documents
var docRef = app.documents.add( 4, 4)
var otherDocRef = app.documents.add (4,6)

//make docRef the active document
app.activeDocument = docRef
//here you would include command statements
//that perform actions on the active document. Then, you could
//make a different document the active document

//use the activeDocument property of the Application object to
//bring otherDocRef front-most as the new active document
app.activeDocument = otherDocRef
```

## Setting the Active Layer

The following examples demonstrate how to use the `current layer (ActiveLayer/activeLayer)` property of the `Document` object to set the active layer.

### AS

```
set current layer of current document to layer “Layer 1” of current document
```

### VBS

```
docRef.ActiveLayer = docRef.Layers("Layer 1")
```

Look up the `ActiveLayer` property in the Properties table of the `Document` object in the “Interface” chapter of the *Adobe Photoshop CS2 Visual Basic Scripting Reference*.

### JS

```
docRef.activeLayer = docRef.layers["Layer 1"]
```

Look up the `activeLayer` property in the Properties table of the `Document` object in the “Interface” chapter of the *Adobe Photoshop CS2 Scripting Guide*.

## Setting the Active Channels

More than one channel can be active at a time.

### AS

Set the active channels to the first and third channel using a channel array:

```
set current channels of current document to ¬
   { channel 1 of current document, channel 3 of current document }
```

Alternatively, select all component channels using the `component channels` property of the `Document` object.

```
set current channels of current document to component channels ¬
   of current document
```

### VBS

Set the active channels to the first and third channel using a channel array:

```
Dim theChannels
theChannels = Array(docRef.Channels(0), docRef.Channels(2))
```

```
docRef.ActiveChannels = theChannels
```

Alternatively, select all component channels using the `ComponentChannels` property of the `Document` object:

```
appRef.ActiveDocument.ActiveChannels= _
   appRef.ActiveDocument.ComponentChannels
```

### JS

Set the active channels to the first and third channel using a channel array:

```
theChannels = new Array(docRef.channels[0], docRef.channels[2])
docRef.activeChannels = theChannels
```

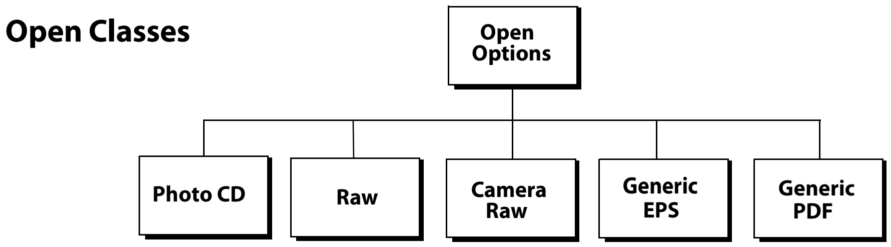
Alternatively, select all component channels by using the `componentChannels` property of the `Document` object:

```
app.activeDocument.activeChannels =
   activeDocument.componentChannels
```

## Opening a Document

You use the `open`/`Open`/`open()` command/method of the `Application` object to open an existing document. You must specify the document name (that is, the path to the file that contains the document) with the command/method.

### Specifying File Formats to Open



Because Photoshop CS2 supports many different file formats, the `open`/`Open`/`open()` command lets you specify the format of the document you are opening. If you do not specify the format, Photoshop CS2 will infer the type of file for you. The following examples open a document using its default type:

### AS

```
set theFile to alias "Applications:Documents:MyFile"
open theFile
```

or

```
set theFile to a reference to "Applications:Documents:MyFile"
open theFile
```

### VBS

```
fileName = "C:\MyFile"
Set docRef = appRef.Open(fileName)
```

## JS

```
var fileRef = new File("//MyFile")
var docRef = app.open (fileRef)
```

Notice that in JavaScript, you must create a `File` object and then pass a reference to the object to the `open()` command.

For the document types on the following list, you can set options to specify how the document will be opened, such as the height and width of the window in which the document is opened, which page to open to in a multi-page file, etc.

- PhotoCD
- CameraRaw
- RawFormat
- Adobe PDF
- EPS

To find out which options you can set for each of file type, look up the properties for the *OpenOptions* objects that begin with the file format name. For example:

- In the *Adobe Photoshop CS2 AppleScript Scripting Reference* look up the `Photo CD open options` class or the `EPS open objects` class.
- In the *Adobe Photoshop CS2 Visual Basic Scripting Reference* and the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up the `PhotoCDOpenOptions` or `EPSOpenOptions` objects.

The following examples demonstrate how to open a generic (multi-page/multi-image) PDF document with the following specifications:

- The document will open in a window that is 100 pixels high and 200 pixels wide.
- The document will open in RGB mode with a resolution of 72 pixels/inch.
- Antialiasing will be used to minimize the jagged appearance of the edges of images in the document.
- The document will open to page 3.
- The document's original shape will change to conform to the height and width properties if the original shape is not twice as wide as it is tall.

## AS

```
tell application "Adobe Photoshop CS2"
   set myFilePath to alias “Applications:PDFFiles:MyFile.pdf”
   open myFilePath as PDF with options ¬
      {class:PDF open options, height:pixels 100, ¬
         width:pixels 200, mode:RGB, resolution:72, ¬
            use antialias:true, page:3, ¬
               constrain proportions:false}
end tell
```

## VBS

```
Dim appRef
Set appRef = CreateObject("Photoshop.Application")

'Remember unit settings and set to values expected by this script
Dim originalRulerUnits
originalRulerUnits = appRef.Preferences.RulerUnits
appRef.Preferences.RulerUnits = psPixels
```

```
'Create a PDF option object
Dim pdfOpenOptionsRef
Set pdfOpenOptionsRef = CreateObject("Photoshop.PDFOpenOptions")
pdfOpenOptionsRef.AntiAlias = True
pdfOpenOptionsRef.Height = 100
pdfOpenOptionsRef.Width = 200
pdfOpenOptionsRef.mode = psOpenRGB
pdfOpenOptionsRef.Resolution = 72
pdfOpenOptionsRef.Page = 3
pdfOpenOptionsRef.ConstrainProportions = False

' open the file
Dim docRef
Set docRef = appRef.Open(C:\\PDFFiles\MyFile.pdf, pdfOpenOptionsRef)

'Restore unit setting
appRef.Preferences.RulerUnits = originalRulerUnits
```

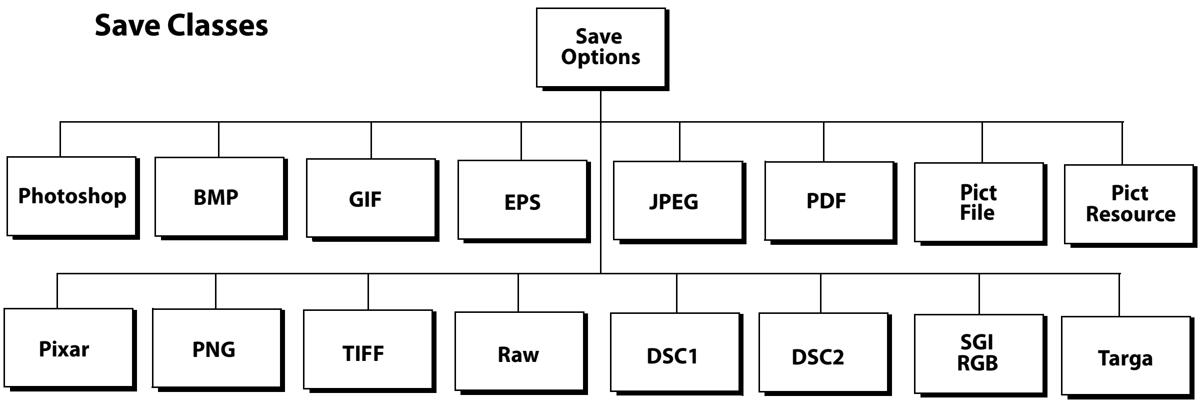
### JS

```
// Set the ruler units to pixels
var originalRulerUnits = app.preferences.rulerUnits
app.preferences.rulerUnits = Units.PIXELS
// Get a reference to the file that we want to open
var fileRef = new File( C:\\PDFFiles\MyFile.pdf )

// Create a PDF option object
var pdfOpenOptions = new PDFOpenOptions
pdfOpenOptions.antiAlias = true
pdfOpenOptions.height = 100
pdfOpenOptions.width = 200
pdfOpenOptions.mode = OpenDocumentMode.RGB
pdfOpenOptions.resolution = 72
pdfOpenOptions.page = 3
pdfOpenOptions.constrainProportions = false

// open the file
app.open( fileRef, pdfOpenOptions )

// restore unit settings
app.preferences.rulerUnits = originalRulerUnits
```

## Saving a Document

Options for saving documents in Photoshop CS2 are illustrated below. To find out which properties you can specify for a specific file format save option, look up the object that begins with the file format name. For example, to find out about properties for saving an `.eps` file, do the following:

- In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up the `Class EPS save options`.
- In the *Adobe Photoshop CS2 Visual Basic Scripting Reference* and *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up `EPSSaveOptions`.



**Note:** It is important to note that the `Open` and `Save` formats are not identical. See `'Opening a Document' on page 42` for comparison.

**Note:** The following optional formats are available only when installed explicitly:

- Alias PIX
- Electric Image
- SGI RGB
- Wavefront RLA
- SoftImage

The following scripts save a document as a `.jpeg` file.

## AS

```
tell application "Adobe Photoshop CS2"
   make new document
   set myOptions to {class:JPEG save options, ¬
      embed color profile:false, format options: standard, ¬
         matte: background color matte,}
   save current document in file myFile as JPEG with options ¬
      myOptions appending no extension without copying
end tell
```

## VBS

```
Dim appRef
Set jpgSaveOptions = CreateObject("Photoshop.JPEGSaveOptions")
jpgSaveOptions.EmbedColorProfile = True
jpgSaveOptions.FormatOptions = 1 'for psStandardBaseline
jpgSaveOptions.Matte = 1 'for psNoMatte
jpgSaveOptions.Quality = 1
appRef.ActiveDocument.SaveAs "c:\temp\myFile2", _
   jpgSaveOptions, True, 2 'for psLowercase
```

## JS

```
jpgFile = new File( "/Temp001.jpeg" )
jpgSaveOptions = new JPEGSaveOptions()
```

```
jpgSaveOptions.embedColorProfile = true
jpgSaveOptions.formatOptions = FormatOptions.STANDARDBASELINE
jpgSaveOptions.matte = MatteType.NONE
jpgSaveOptions.quality = 1
app.activeDocument.saveAs(jpgFile, jpgSaveOptions, true,
   Extension.LOWERCASE)
```

## Setting Application Preferences

Your script can set application preferences such as color picker, file saving options, guide-grid-slice settings, and so on.

**Note:** The properties in the `settings` class/`Preferences` object correlate to the Photoshop CS2 Preferences dialog options, which you display by choosing **Photoshop > Preferences** on Mac OS or **Edit > Preferences** in Windows versions of Photoshop CS2. For explanations of individual preferences, please refer to Photoshop CS2 Help.

### AS

You use properties of the `settings` class to set application preferences in AppleScript. The following script sets ruler and type unit settings:

```
set ruler units of settings to inch units
set type units of settings to pixel units
```

In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up `Class settings-object` to view all of the settings properties you can use.

### VBS

The `Preferences` object is a property of the `Application` object. When you use the `Preferences` object in a VBScript script, you must indicate its containment in the `Application` object.

```
appRef.Preferences.RulerUnits = 2 'for PsUnits --> 2 (psInches)
appRef.Preferences.TypeUnits = 1 'for PsTypeUnits --> 1 (psPixels)
```

In the *Adobe Photoshop CS2 Visual Basic Scripting Reference*, look up the `Preferences` object to view all of the settings properties you can use. Additionally, look up the `Application` object > `Preferences` property.

### JS

The Preferences object is a property of the `Application` object.

```
preferences.rulerUnits =Units.INCHES
preferences.typeUnits = TypeUnits.PIXELS
```

In the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up the `Preferences` object to view all of the settings properties you can use. Additionally, look up the `Application` object > `preferences` property.

## Allowing or Preventing Dialogs

It is important to be able to control dialogs properly from a script. If a dialog appears, your script stops until a user dismisses the dialog. This is normally fine in an interactive script that expects a user to be sitting at the machine. But if you have a script that runs in an unsupervised (batch) mode, you do not want dialogs to be displayed and stop your script.

You use the `display dialogs` (`DisplayDialogs/displayDialogs`) property of the `Application` object to control whether or not dialogs are displayed.

**Note:** Using dialogs in your script is roughly equivalent to using stops in a Photoshop CS2 action.

### AS

The following script prevents dialogs from being displayed:

```
set display dialogs to never
```

In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up the `Class application` to find the values you can use for the `display dialogs` property.

### VBS

To set dialog preferences, you use the `DisplayDialogs` property of the `Application` object.

```
appRef.DisplayDialogs = 3
'for PsDialogModes --> 3 (psDisplayNoDialogs)
```

Note that, because `DisplayDialogs` is a property of the `Application` object, you must reference the `Application` object in the script to get to the property.

In the *Adobe Photoshop CS2 Visual Basic Scripting Reference*, look up the `Application` object property `DisplayDialogs`. You'll see the value type for this property is the constant `psDialogModes`. In the "Constants" chapter, look up the options for `psDialogModes`.

### JS

To set dialog preferences, you use the `displayDialogs` property of the `Application` object.

```
displayDialogs = DialogModes.NO
```

In the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up the `Application` object property `displayDialogs`, and then look up the constant `DialogModes` in the "Constants" chapter.

## Working with the Photoshop CS2 Object Model

This section contains information about using the objects in the Photoshop CS2 Object Model. For information on object models, see 'Object Model Concepts' on page 7 and 'Photoshop CS2's Object Model' on page 8.

### Using the Application Object

This section describes how and when to use the `Application` object in a script. It also describes how to use some properties of the `Application` object.

You use the properties and commands/methods of the `Application` object to work with Photoshop CS2 functionality and objects such as the following:

- Global Photoshop CS2 settings or preferences, such as unit values or color settings. See 'Setting Application Preferences' on page 46.
- Documents—You can add or open documents and set the active document. 'Opening a Document' on page 42 and 'Setting the Active Object' on page 39.
- Actions—You can execute actions created either via scripting or using the Actions palette in the Photoshop CS2 application.

You can use Application object properties to get information such as the following:

- A list of fonts installed on the system.
  - AS: `Set theFonts to fonts`
  - VBS: `Set fontsInstalled = AppRef.fonts`

- JS: `var fontstInstalled = app.fonts`
- The amount of unused memory available to Adobe Photoshop CS2.
- The location of the Presets folder.

**Note:** See `'Creating and Running a JavaScript' on page 24` for information on the Presets folder.

## Using the Document Object

The `Document` object can represent any open document in Photoshop CS2. You can think of a `Document` object as a file; you can also think of it as a canvas. You work with the `Document` object to do the following:

- Access script objects contained in the `Document` object, such as `ArtLayer` or `Channel` objects. See `'Containment Hierarchy' on page 8` and `'Photoshop CS2's Object Model' on page 8` for more information.
- Manipulate a specific `Document` object. For example, you could crop, rotate or flip the canvas, resize the image or canvas, and trim the image. See `'Manipulating a Document Object' on page 48` for a demonstration.
- Get the active layer. See `'Setting the Active Layer' on page 41`.
- Save the current document. See `'Saving a Document' on page 44`.
- Copy and paste within the active document or between different documents. See `'Understanding Clipboard Interaction' on page 66`.

### Manipulating a Document Object

The following examples demonstrate how to do the following:

- Change the size of the image to 4 inches wide and 4 inches high.
- Change the size of the document window (or canvas) to 5 inches high and 6 inches wide.
- Trim the top and bottom of the image.
- Crop the image.
- Flip the entire window.

**Note:** The following examples assume the ruler units have been set to inches. See `'Setting Application Preferences' on page 46` for information on ruler units.

### AS

```
--this script sample assumes the ruler units have been set to inches
resize image current document width 4 height 4
resize canvas current document width 4 height 4
trim current document basing trim on top left pixel ¬
   with top trim and bottom trim without left trim and right trim

--the crop command uses unit values
--change the ruler units to pixels
set ruler units of settings to pixel units
crop current document bounds {10, 20, 40, 50} angle 45 ¬
   resolution 72 width 20 height 20
flip canvas current document direction horizontal
```

### VBS

```
'this script sample assumes the ruler units have been set to inches
docRef.ResizeImage 4,4
docRef.ResizeCanvas 4,4
docRef.Trim Type:=psTopLeftPixel, Top:=True, Left:=False, _
   Bottom:=True, Right:=False

'the crop command uses unit values
'change the ruler units to pixels
app.Preferences.RulerUnits = Photoshop.PsUnits.psPixels
docRef.Crop Array(10,20,40,50), Angle:=45, Width:=20, _
   Height:=20, Resolution:=72
docRef.FlipCanvas psHorizontal
```

### JS

```
//this sample script assumes the ruler units have been set to inches
docRef.resizeImage( 4,4 )
docRef.resizeCanvas( 4,4 )
docRef.trim(TrimType.TOPLEFT, true, false, true, false)

//the crop command uses unit values
//change the ruler units to pixels
app.preferences.rulerUnits =Units.PIXELS
docRef.crop (new Array(10,20,40,50), 45, 20, 20, 72)
docRef.flipCanvas(Direction.HORIZONTAL)
```

## Working with Layer Objects

The Photoshop CS2 object model contains two types of layer objects:

- `ArtLayer` objects, which can contain image contents and are basically equivalent to Layers in the Photoshop CS2 application.

  **Note:** An `ArtLayer` object can also contain text if you use the `kind` property to set the `ArtLayer` object's type to text layer.

- `Layer Set` objects, which can contain zero or more `ArtLayer` objects.

When you create a layer you must specify whether you are creating an `ArtLayer` or a `Layer Set`.

**Note:** Both the `ArtLayer` and `LayerSet` objects have corresponding collection objects, `ArtLayers` and `LayerSets`, which have an `add/Add/add()` command/method.You can reference, but not add, `ArtLayer` and `LayerSet` objects using the `Layers` collection object, because, unlike other collection objects, it does not have an `add/Add/add()` command/method.

## Creating an ArtLayer Object

The following examples demonstrate how to create an `ArtLayer` object filled with red at the beginning of the current document.

### AS

```
tell application "Adobe Photoshop CS2"
   make new art layer at beginning of current document ¬
      with properties {name:"MyBlendLayer", blend mode:normal}
   select all current document
   fill selection of current document with contents ¬
      {class:RGB color, red:255, green:0, blue:0}
end tell
```

### VBS

```
Dim appRef
Set appRef = CreateObject("Photoshop.Application")

' Create a new art layer at the beginning of the current document
Dim docRef
Dim layerObj
Set docRef = appRef.ActiveDocument
Set layerObj = appRef.ActiveDocument.ArtLayers.Add
layerObj.Name = "MyBlendLayer"
layerObj.BlendMode = psNormalBlend

' Select all so we can apply a fill to the selection
appRef.ActiveDocument.Selection.SelectAll

' Create a color to be used with the fill command
Dim colorObj
Set colorObj = CreateObject("Photoshop.SolidColor")
colorObj.RGB.Red = 255
colorObj.RGB.Green = 100
colorObj.RGB.Blue = 0

' Now apply fill to the current selection
appRef.ActiveDocument.Selection.Fill colorObj
```

### JS

```
// Create a new art layer at the beginning of the current document
var layerRef = app.activeDocument.artLayers.add()
layerRef.name = "MyBlendLayer"
layerRef.blendMode = BlendMode.NORMAL

// Select all so we can apply a fill to the selection
app.activeDocument.selection.selectAll

// Create a color to be used with the fill command
var colorRef = new SolidColor
colorRef.rgb.red = 255
colorRef.rgb.green = 100
colorRef.rgb.blue = 0

// Now apply fill to the current selection
app.activeDocument.selection.fill(colorRef)
```

The following examples show how to create a `Layer Set` object after the creating the first `ArtLayer` object in the current document:

### AS

```
tell application "Adobe Photoshop CS2"
   make new layer set after layer 1 of current document
end tell
```

### VBS

```
Dim appRef
Set appRef = CreateObject("Photoshop.Application")

' Get a reference to the first layer in the document
Dim layerRef
Set layerRef = appRef.ActiveDocument.Layers(1)

' Create a new LayerSet (it will be created at the beginning of the ' document)
Dim newLayerSetRef
Set newLayerSetRef = appRef.ActiveDocument.LayerSets.Add

' Move the new layer to after the first layer
newLayerSetRef.Move layerRef, psPlaceAfter
```

### JS

```
// Get a reference to the first layer in the document
var layerRef = app.activeDocument.layers[0]

// Create a new LayerSet (it will be created at the beginning of the // document)
var newLayerSetRef = app.activeDocument.layerSets.add()

// Move the new layer to after the first layer
newLayerSetRef.move(layerRef, ElementPlacement.PLACEAFTER)
```

## Referencing ArtLayer Objects

When you create a layer in the Photoshop CS2 application (rather than a script), the layer is added to the Layers palette and given a number. These numbers act as layer names and do not correspond to the index numbers of `ArtLayer` objects you create in a script.

Your VBScript script or JavaScript will always consider the layer at the top of the list in the Layers palette as the first layer in the index. For example, if your document has four layers, the Photoshop CS2 application names them Background Layer, Layer 1, Layer 2, and Layer 3. Normally, Layer 3 would be at the top of the list in the Layers palette because you added it last. If your script is working on this open document and uses the syntax `Layers(0).Select/layers[0].select()` to tell Photoshop CS2 to select a layer, Layer 3 will be selected. If you then you drag the Background layer to the top of the list in the Layers palette and run the script again, the Background layer is selected.

You can use the following syntax to refer to the layers by the names given them by the Application:

### AS

```
layer 1 of layer set 1 of current document
```

**Note:** Unlike object references in JavaScript or VBScript, AppleScript object reference names do not remain constant. Refer to an AppleScript language guide or text book for information on referencing a file using either `as alias` or `to a reference to file`.

### VBS

```
Layers("Layer 3").Select
```

### JS

```
layers["Layer 3"].select() //using the collection name and square brackets for the
collection
```

## Working with Layer Set Objects

Existing layers can be moved into layer sets. The following examples show how to create a `Layer Set` object, duplicate an existing `ArtLayer` object, and move the duplicate object into the layer set.

### AS

```
set current document to document "My Document"
set layerSetRef to make new layer set at end of current document
set newLayer to duplicate layer "Layer 1" of current document¬
   to end of current document
move newLayer to end of layerSetRef
```

In AppleScript, you can also duplicate a layer directly into the destination layer set.

```
set current document to document "My Document"
set layerSetRef to make new layer set at end of current document
duplicate layer "Layer 1" of current document to end of layerSetRef
```

### VBS

In VBScript you must duplicate and place the layer.

```
Set layerSetRef = docRef.LayerSets.Add
Set layerRef = docRef.ArtLayers(1).Duplicate
   layerSetRef.Move appRef, 0 'for psElementPlacement --> 0 psPlaceAtEnd
layerRef.MoveToEnd layerSetRef
```

### JS

In JavaScript you must duplicate and place the layer.

```
var layerSetRef = docRef.layerSets.add()
var layerRef = docRef.artLayers[0].duplicate(layerSetRef,
   ElementPlacement.PLACEATEND)
layerRef.moveToEnd (layerSetRef)
```

### Linking Layer Objects

Scripting also supports linking and unlinking layers. You link layers together so that you can move or transform the layers in a single statement.

### AS

```
make new art layer in current document with properties {name:"L1"}
make new art layer in current document with properties {name:"L2"}
link art layer "L1" of current document with art layer "L2" of ¬
```

```
    current document
```

Look up the `link` command in the *Adobe Photoshop CS2 AppleScript Scripting Reference*.

### VBS

```
Set layer1Ref = docRef.ArtLayers.Add()
Set layer2Ref = docRef.ArtLayers.Add()
layer1Ref.Link layer2Ref.Layer
```

Look up `Link` in the Methods table of the `ArtLayer` object in the *Adobe Photoshop CS2 Visual Basic Scripting Reference*. Additionally, look up `Add` in the Methods table of the `ArtLayers` object.

### JS

```
var layerRef1 = docRef.artLayers.add()
var layerRef2 = docRef.artLayers.add()
layerRef1.link(layerRef2)
```

Look up `link()` in the Methods table of the `ArtLayer` object in the *Adobe Photoshop CS2 JavaScript Scripting Reference*. Additionally, look up `add()` in the Methods table of the `ArtLayers` object.

## Applying Styles to Layers

**Note:** This procedure corresponds directly to dragging a style from the Photoshop CS2 Styles palette to a layer.

Your script can apply styles to an `ArtLayer` object. To apply a style in a script, you use the `apply layer style/ApplyStyle/applyStyle()` command/method with the style's name as an argument enclosed in straight double quotes.

**Note:** The layer style names are case sensitive.

Please refer to Photoshop CS2 Help for a list of styles and for more information about styles and the Styles palette.

The following examples set the Puzzle layer style to the layer named "L1."

### AS

```
apply layer style art layer "L1" of current document using ¬
   "Puzzle (Image)"
```

Look up the `apply layer style` command in the "Commands" chapter of the *Adobe Photoshop CS2 AppleScript Scripting Reference*.

### VBS

```
docRef.ArtLayers("L1").ApplyStyle "Puzzle (Image)"
```

Look up `ApplyStyle` in the Methods table of the `ArtLayer` object in the *Adobe Photoshop CS2 Visual Basic Scripting Reference*.

### JS

```
docRef.artLayers["L1"].applyStyle("Puzzle (Image)")
```

Look up `applyStyle()` in the Methods table of the `ArtLayer` object in the *Adobe Photoshop CS2 JavaScript Scripting Reference*.

## Using the Text Item Object

You can change an existing `ArtLayer` object to a text layer, that is, a `Text Item` object, if the layer is empty. Conversely you can change a `Text Item` object to an `ArtLayer` object. This “reverse” procedure rasterizes the text in the layer object.

The `Text Item` object is a property of the `ArtLayer` object. However, to create a new text layer, you must create a new `ArtLayer` object and then set the art layer's `kind/Kind/kind` property to `text layer /psTextLayer/ LayerKind.TEXT`.

To set or manipulate text in a text layer, you use the `text object/TextItem/textItem/` object, which is also a property of the `ArtLayer` object.

### Creating a Text Item Object

The following examples create an `ArtLayer` object and then use the `kind` property to convert it to a text layer.

#### AS

```
make new art layer in current document with properties ¬
   { kind: text layer }
```

#### VBS

```
set newLayerRef = docRef.ArtLayers.Add()
newLayerRef.Kind = 2
'2 indicates psTextLayer
```

#### JS

```
var newLayerRef = docRef.artLayers.add()
newLayerRef.kind = LayerKind.TEXT
```

See ‘Photoshop CS2’s Object Model’ on page 8 for information on the relationship between `ArtLayer` objects and `TextItem` objects.

Also, look up the following:

- The `kind` and `TextItem` properties of the `ArtLayer` object in the *Adobe Photoshop CS2 Visual Basic Scripting Reference* and the *Adobe Photoshop CS2 JavaScript Scripting Reference*.
- The `kind` and `text object` properties of the `Class art layer` in the *Adobe Photoshop CS2 AppleScript Scripting Reference*.

### Determining a Layer’s Kind

The following examples use an `if` statement to check whether an existing layer is a text layer.

#### AS

```
if (kind of layerRef is text layer) then
```

#### VBS

```
If layerRef.Kind = 2 Then
'2 indicates psTextLayer
```

### JS

```
if (newLayerRef.kind == LayerKind.TEXT)
```

### Adding and Manipulating Text in a Text Item Object

The following examples add and right-justify text in a text layer.

### AS

```
set contents of text object of art layer "my text" to "Hello, World!"
set justification of text object of art layer "my text" of ¬
   current document to right
```

### VBS

```
Set textItemRef = artLayers("my text").TextItem
textItemRef.Contents = "Hello, World!"
docRef.ArtLayers("my text").TextItemRef.Justification = 3
'3 = psRight (for the constant value psJustification)
```

### JS

```
var textItemRef = artLayers["my text"].textItem
textItemRef.contents = "Hello, World!"
docRef.artLayers["my text"].textItemRef.justification =
   Justification.RIGHT
```

**Note:** The `text item` object has a `kind` property, which can be set to either `point text /psPointText/TextType.POINTTEXT/` or `paragraph text/psParagraphText/TextType.PARAGRAPHTEXT`. When a new `text item` is created, its `kind` property is automatically set to `point text`.

The `text item` properties `height, width` and `leading` are valid only when the text item's `kind` property is set to `paragraph text.`

To familiarize yourself with this objects, properties, and commands/methods in the scripting references, do the following:

- In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up the `Class text-object` properties and methods.
- In the *Adobe Photoshop CS2 Visual Basic Scripting Reference* and the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up the `TextItem` property of the `ArtLayer` object. To find the properties and methods you can use with a text layer, look up the `TextItem` object.

## Working with Selection Objects

You create a `Selection` object to allow your scripts to act only on a specific, selected section of your document or a layer within a document. For example, you can apply effects to a selection or copy the current selection to the clipboard.

The `Selection` object is a property of the `Document` object. Look up the following for more information:

- In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up `select` in the “Commands” chapter. Also, look up the `selection` property of the `Class Document` object and the `Class selection-object`.

- In the *Adobe Photoshop CS2 Visual Basic Scripting Reference* and the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up selection in the Properties table for the `Document` object. Also, look up the `select` in the Methods table for the `Selection` object.

## Creating and Defining a Selection

To create a selection, you use the `select/Select/select()` command/method of the `Selection` object.

You define a `Selection` object by specifying the coordinates on the screen that describe the selection's corners. Since your document is a 2-dimensional object, you specify coordinates using the x-and y-axes as follows:

- You use the x-axis to specify the horizontal position on the canvas.
- You use the y-axis to specify the vertical position on the canvas.

The origin point in Photoshop CS2, that is, x-axis = 0 and y-axis = 0, is the upper left corner of the screen. The opposite corner, the lower right, is the extreme point of the canvas. For example, if your canvas is 1000 x 1000 pixels, then the coordinate for the lower right corner is x-axis = 1000 and y-axis = 1000.

You specify coordinate points that describe the shape you want to select as an array, which then becomes the argument or parameter value for the `select/Select/select()` command/method.

➤ **The following examples assume that the ruler units have been set to pixels and create a selection by:**

1. Creating a variable to hold a new document that is 500 x 500 pixels in size.
2. Creating a variable to hold the coordinates that describe the selected area (that is, the `Selection` object).
3. Adding an array as the selection variable's value.
4. Using the `Document` object's `selection` property, and the `Selection` object's `select` command/method to select an area. The area's coordinates are the selection variable's values.

### AS

```
set docRef to make new document with properties {height: 500 pixels, width:500
pixels}
set shapeRef to select current document region {{ 0, 0}, {0, 100}, ¬
   { 100, 100}, { 100, 0}}
select current document region shapeRef
```

### VBS

```
DocRef = Documents.Add
ShapeRef = Array((0, 0), (0, 100), (100,100), (100,0))
docRef.Selection.Select ShapeRef
```

### JS

```
var docRef = app.documents.add(500, 500)
var shapeRef = [
   [0,0],
   [0,100],
   [100,100],
   [100,0]
]
docRef.selection.select(shapeRef)
```

## Stroking the Selection Border

The following examples use the `stroke (Stroke/stroke())` command/method of the `Selection` object to stroke the boundaries around the current selection and set the stroke color and width.

**Note:** The transparency parameter cannot be used for background layers.

### AS

```
stroke selection of current document using color ¬
   {class:CMYK color,cyan:20, magenta:50, yellow:30, black:0}¬
   width 5 location inside blend mode vivid light opacity 75 ¬
   without preserving transparency
```

### VBS

```
selRef.Stroke strokeColor, 5, 1, 15, 75, False
```

### JS

```
app.activeDocument.selection.stroke (strokeColor, 2,
   StrokeLocation.OUTSIDE, ColorBlendMode.VIVIDLIGHT, 75,
      false)
```

## Inverting Selections

You can use the i`nvert/Invert/invert()` command/method of the Selection object to a selection so you can work on the rest of the document, layer or channel while protecting the selection.

AS`invert selection of current document`

VBS`selRef.Invert`

JS`selRef.invert()`

## Expanding, Contracting and Feathering Selections

You can change the size of a selected area using the expand, contract, and feather commands.

The values are passed in the ruler units stored in Photoshop CS2 preferences and can be changed by your scripts. If your ruler units are set to pixels, then the following examples will expand, contract and feather by five pixels. See section `'Setting Application Preferences' on page 46` for examples of how to change ruler units.

### AS

```
expand selection of current document by pixels 5
contract selection of current document by pixels 5
feather selection of current document by pixels 5
```

### VBS

```
Dim appRef
Set appRef = CreateObject("Photoshop.Application")

Dim selRef
Set selRef = appRef.ActiveDocument.Selection

selRef.Expand 5
selRef.Contract 5
selRef.Feather 5
```

**JS**

```
var selRef = app.activeDocument.selection
selRef.expand( 5 )
selRef.contract( 5 )
selRef.feather( 5 )
```

## Filling a Selection

You can fill a selection either with a color or a history state.

To fill with a color:

**AS**

```
fill selection of current document with contents ¬
   {class: RGB color, red:255, green:0, blue:0} blend mode ¬
      vivid light opacity 25 without preserving transparency
```

**VBS**

```
Set fillColor = CreateObject("Photoshop.SolidColor")
fillColor.RGB.Red = 255
fillColor.RGB.Green = 0
fillColor.RGB.Blue = 0
selRef.Fill fillColor, 15, 25, False
```

**JS**

```
var fillColor = new SolidColor()
fillColor.rgb.red = 255
fillColor.rgb.green = 0
fillColor.rgb.blue = 0
app.activeDocument.selection.fill( fillColor, ColorBlendMode.VIVIDLIGHT,
   25, false)
```

To fill the current selection with the tenth item in the history state:

**Note:** See `'Using History State Objects' on page 60` for information on `History State` objects.

**AS**

```
fill selection of current document with contents history state 10 ¬
   of current document
```

**VBS**

```
selRef.Fill docRef.HistoryStates(9)
```

**JS**

```
selRef.fill(app.activeDocument.historyStates[9])
```

## Loading and Storing Selections

You can store `Selection` objects in, or load them from, `Channel` objects.The following examples use the `store/Store/store()` command/method of the `Selection` object to store the current selection in a channel named `My Channel` and extend the selection with any selection that is currently in that channel.

### AS

```
store selection of current document into channel "My Channel" of ¬
   current document combination type extended
```

### VBS

```
selRef.Store docRef.Channels("My Channel"), 2
'2 indicates that the value of the constant psExtendSelection
'is 2 (psExtendSelection)
```

### JS

```
selRef.store(docRef.channels["My Channel"], SelectionType.EXTEND)
```

To restore a selection that has been saved to a `Channel` object, use the `load/Load/load()` method.

### AS

```
load selection of current document from channel "My Channel" of ¬
   current document combination type extended
```

### VBS

```
selRef.Load docRef.Channels("My Channel"), 2
'2 indicates that the value of the constant psExtendSelection
'is 2 (psExtendSelection)
```

### JS

```
selRef.load (docRef.channels["My Channel"], SelectionType.EXTEND)
```

See section `‘Understanding Clipboard Interaction’ on page 66` for examples on how to copy, cut and paste selections.

## Working with Channel Objects

The `Channel` object gives you access to much of the available functionality on Photoshop CS2 channels. You can create, delete and duplicate channels or retrieve a channel's histogram and change its kind. See `‘Creating New Objects in a Script’ on page 37` for information on creating a `Channel` object in your script.

You can set or get (that is, find out about) a `Channel` object’s type using the `kind` property. See `‘Understanding and Finding Constants’ on page 19` for script samples that demonstrate how to create a masked area channel.

### Changing Channel Types

You can change the `kind` of a any channel except component channels. The following examples demonstrate how to change a masked area channel to a selected area channel:

**Note:** Component channels are related to the document mode. Refer to Photoshop CS2 Help for information on channels, channel types, and document modes.

### AS

```
set kind of myChannel to selected area channel
```

### VBS

```
channelRef.kind = 3 'for psSelectedAreaAlphaChannel
'from the constant value psChannelType
```

### JS

```
channelRef.kind = ChannelType.SELECTEDAREA
```

## Using the Document Info Object

In Photoshop CS2, you can associate information with a document by choosing **File > File Info**.

To accomplish this task in a script, you use the `DocumentInfo` object. The following examples demonstrate how to use the `DocumentInfo` object to set the copyrighted status and owner URL of a document.

### AS

```
set docInfoRef to info of current document
set copyrighted of docInfoRef to copyrighted work
set owner url of docInfoRef to "http://www.adobe.com"
```

### VBS

```
Set docInfoRef = docRef.Info
docInfoRef.Copyrighted = 1 'for psCopyrightedWork
docInfoRef.OwnerUrl = "http://www.adobe.com"
```

### JS

```
docInfoRef = docRef.info
docInfoRef.copyrighted = CopyrightedType.COPYRIGHTEDWORK
docInfoRef.ownerUrl = "http://www.adobe.com"
```

For information about other types of information (properties) you can associate with a document, look up the following:

- In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up the properties for the `Class info-object`.
- In the *Adobe Photoshop CS2 Visual Basic Scripting Reference* and the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up the Properties table for the `DocumentInfo` object.

## Using History State Objects

Photoshop CS2 keeps a history of the actions that affect documents. Each time you save a document in the Photoshop CS2 application, you create a *history state*; you can access a document’s history states from the History palette by selecting **Window > History**.

In a script, you can access a `Document` object's history states using the `HistoryStates` object, which is a property of the `Document` object. You can use a `HistoryStates` object to reset a document to a previous state or to fill a `Selection` object.

The following examples revert the document contained in the variable `docRef` back to the form and properties it had when it was first saved. Using history states in this fashion gives you the ability to undo modifications to the document.

### AS

```
set current history state of current document to history state 1 ¬
   of current document
```

### VBS

```
docRef.ActiveHistoryState = docRef.HistoryStates(0)
```

### JS

```
docRef.activeHistoryState = docRef.historyStates[0]
```

**Note:** Reverting back to a previous history state does not remove any latter states from the history collection. Use the `Purge` command to remove latter states from the `History States` collection as shown below:

AS`purge history caches`

VBS`appRef.Purge(2) 'for psPurgeTarget --> 2 (psHistoryCaches)`

JS`app.purge(PurgeTarget.HISTORYCACHES)`

The example below saves the current state, applies a filter, and then reverts back to the saved history state.

### AS

```
set savedState to current history state of current document
filter current document using motion blur with options ¬
   {angle:20, radius: 20}
set current history state of current document to savedState
```

### VBS

```
Set savedState = docRef.ActiveHistoryState
docRef.ApplyMotionBlur 20, 20
docRef.ActiveHistoryState = savedState
```

### JS

```
savedState = docRef.activeHistoryState
docRef.applyMotionBlur( 20, 20 )
docRef.activeHistoryState = savedState
```

## Using Notifier Objects

You use the `Notifier` object to tie an event to a script. For example, if you would like Photoshop CS2 to automatically create a new document when you open the application, you could tie a script that creates a `Document` object to an `Open Application` event.

**Note:** This type of script corresponds to selecting *Start Application* in the Script Events Manager (**File > Scripts > Script Events Manager**) in the Photoshop CS2 application. Please refer to Photoshop CS2 Help for information on using the Script Events Manager.

## Using the PathItem Object

To add a `PathItem` object, you create an array of `PathPointInfo` objects, which specify the coordinates of the corners or anchor points of your path. Additionally, you can create an array of `SubPathInfo` objects to contain the `PathPoint` arrays.

The following script creates a `PathItem` object that is a straight line.

### AS

```
--line #1--it’s a straight line so the coordinates for anchor, left, and
--right for each point have the same coordinates
tell application "Adobe Photoshop CS2"
   set ruler units of settings to pixel units
   set type units of settings to pixel units

   set docRef to make new document with properties {height:700, width:500,¬
      name:"Snow Cone"}

   set pathPointInfo1 to {class:path point info, kind:corner point,¬
      anchor:{100, 100}, left direction:{100, 100}, right direction:{100, 100}}
   set pathPointInfo2 to {class:path point info, kind:corner point,¬
      anchor:{150, 200}, left direction:{150, 200}, right direction:{150, 200}}
   set subPathInfo1 to {class:sub path info, entire sub path:{pathPointInfo1,¬
      pathPointInfo2}, operation:shape xor, closed:false}

   set newPathItem to make new path item in docRef with properties {entire path:¬
      {subPathInfo1, subPathInfo2} kind:normal}

end tell
```

### VBS

```
'line #1--it’s a straight line so the coordinates for anchor, left, and
'right for each point have the same coordinates
Set lineArray(1) = CreateObject("Photoshop.PathPointInfo")
lineArray(1).Kind = 2 ' for PsPointKind --> 2 (psCornerPoint)
lineArray(1).Anchor = Array(100, 100)
lineArray(1).LeftDirection = lineArray(1).Anchor
lineArray(1).RightDirection = lineArray(1).Anchor

Set lineArray(2) = CreateObject("Photoshop.PathPointInfo")
lineArray(2).Kind = 2
lineArray(2).Anchor = Array(150, 200)
lineArray(2).LeftDirection = lineArray(2).Anchor
lineArray(2).RightDirection = lineArray(2).Anchor

Set lineSubPathArray(1) = CreateObject("Photoshop.SubPathInfo")
lineSubPathArray(1).operation = 2 'for PsShapeOperation --> 2 (psShapeXOR)
lineSubPathArray(1).Closed = false
lineSubPathArray(1).entireSubPath = lineArray
```

### JS

```
//line #1--it’s a straight line so the coordinates for anchor, left, and //right
//for each point have the same coordinates
var lineArray = new Array()
   lineArray[0] = new PathPointInfo
   lineArray[0].kind = PointKind.CORNERPOINT
   lineArray[0].anchor = Array(100, 100)
   lineArray[0].leftDirection = lineArray[0].anchor
   lineArray[0].rightDirection = lineArray[0].anchor

   lineArray[1] = new PathPointInfo
   lineArray[1].kind = PointKind.CORNERPOINT
   lineArray[1].anchor = Array(150, 200)
   lineArray[1].leftDirection = lineArray[1].anchor
   lineArray[1].rightDirection = lineArray[1].anchor

var lineSubPathArray = new Array()
   lineSubPathArray[0] = new SubPathInfo()
   lineSubPathArray[0].operation = ShapeOperation.SHAPEXOR
   lineSubPathArray[0].closed = false
   lineSubPathArray[0].entireSubPath = lineArray
```

## Working with Color Objects

Your scripts can use the same range of colors that are available from the Photoshop CS2 user interface. Each color model has its own set of properties. For example, the `RGB color` class contains three properties: red, blue and green. To set a color in this class, you indicate values for each of the three properties.

In VBScript and JavaScript, the `SolidColor` class contains a property for each color model. To use this object, you first create an instance of a `SolidColor` object, then set appropriate color model properties for the object. Once a color model has been assigned to a `SolidColor` object, the `SolidColor` object cannot be reassigned to a different color model.

The following examples demonstrate how to set a color using the `CMYK color` class.

### AS

```
set foreground color to {class:CMYK color, cyan:20.0, ¬
   magenta:90.0, yellow:50.0, black:50.0}
```

### VBS

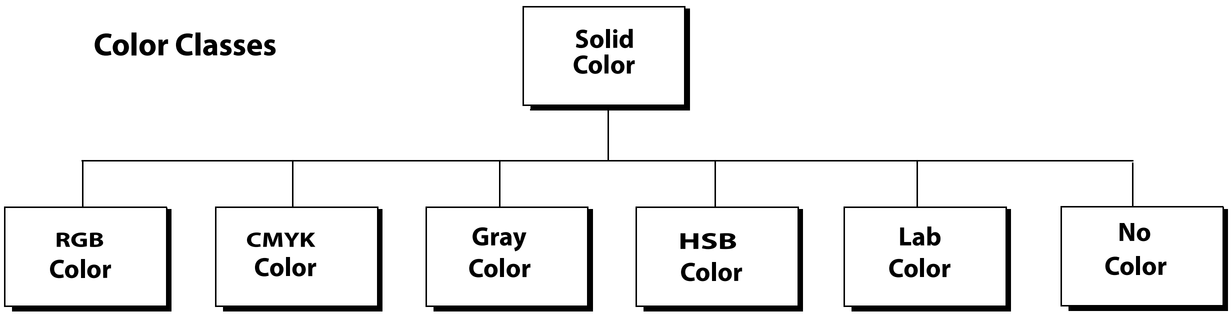
```
'create a solidColor array
Dim solidColorRef
Set solidColorRef = CreateObject("Photoshop.SolidColor")
solidColorRef. CMYK.Cyan = 20
solidColorRef.CMYK.Magenta = 90
solidColorRef.CMYK.Yellow = 50
solidColorRef.CMYK.Black = 50

appRef.ForegroundColor = solidColorRef
```

### JS

```
//create a solid color array
var solidColorRef = new SolidColor()
solidColorRef.cmyk.cyan = 20
solidColorRef.cmyk.magenta = 90
solidColorRef.cmyk.yellow = 50
solidColorRef.cmyk.black = 50

foregroundColor = solidColorRef
```

### Solid Color Classes

The solid color classes available in Photoshop CS2 are illustrated below.



### Using Hex Values

You can express RGB colors as hex (or *hexadecimal*) values. A hex value contains three pairs of numbers which represent red, blue and green (in that order).

In AppleScript, the hex value is represented by the `hex value` string property in class `RGB hex color`, and you use the `convert color` command described below to retrieve the hex value.

In VBScript and JavaScript, the RGBColor object has a string property called `HexValue/hexValue`.

## Getting and Converting Colors

The following examples convert an RGB color to its CMYK equivalent.

### AS

The following script, which assumes an RGB color model, gets the foreground color and then uses the `convert` command of the `color` class to convert the color to its CMYK equivalent.

```
get foreground color
convert color foreground color to CMYK
```

Look up the following in the *Adobe Photoshop CS2 AppleScript Scripting Reference*:

- In the “Objects” chapter, the `foreground color` property of the `Class application`
- In the “Commands” chapter, `convert`

### VBS

The following script uses an `If Then` statement and the `model` property of the `SolidColor` object to determine the color model in use. The `If Then` statement returns a `SolidColor` object; if it returns an `RGB` object, the `cmyk` property of the `SolidColor` object then converts the color to its CMYK equivalent.

```
Dim someColor
If (someColor.model = 2) Then
```

```
        someColor.cmyk
        'someColor.model = 2 indicates psColorModel --> 2 (psRGBModel)
    End If
```

Look up the following in the *Adobe Photoshop CS2 Visual Basic Scripting Reference*:

- `model` and `cmyk` in the `Properties` table of the SolidColor object

### JS

This example uses the `foregroundColor` property of the `Application` object to get the original color to be converted.

```
var someColor = foregroundColor.cmyk
```

Look up the following in the *Adobe Photoshop CS2 JavaScript Scripting Reference*:

- `cmyk` in the Properties table of the `SolidColor` object
- `foregroundColor` in the Properties table of the **`Application`** object

## Comparing Colors

Using the `equal colors/IsEqual/isEqual()` command/method, you can compare colors. The following statements return `true` if the foreground color is visually equal to background color.

AS`if equal colors foreground color with background color then`

VBS`If (appRef.ForegroundColor.IsEqual(appRef.BackgroundColor)) Then`

JS`if (app.foregroundColor.isEqual(backgroundColor))`

## Getting a Web Safe Color

To convert a color to a web safe color use the `web safe color` command on AppleScript and the `NearestWebColor/nearestWebColor` property of the `SolidColor` object for VBScript and JavaScript.

### AS

```
set myWebSafeColor to web safe color for foreground color
```

### VBS

```
Dim myWebSafeColor
Set myWebSafeColor = appRef.ForegroundColor.NearestWebColor
```

### JS

```
var webSafeColor = new RGBColor()
webSafeColor = app.foregroundColor.nearestWebColor
```

## Working with Filters

To apply a filter in an AppleScript, you use the `filter` command with an option from the `Class filter options`. In VBScript and JavaScript, you use a specific filter method. For example, to apply a Gaussian blur filter, you use the `ApplyGaussianBlur/applyGaussianBlur()` method. All filter methods belong to the `ArtLayer` object.

**Note:** Please refer to Photoshop CS2 Help for information about the effects produced by individual filter types.

The following examples apply the Gaussian blur filter to the active layer.

### AS

Use the `filter` command and then both specify the layer and the name of the filter and any options.

```
filter current layer of current document using Gaussian blur ¬
    with options { radius: 5 }
```

**Note:** In the *Adobe Photoshop CS2 AppleScript Scripting Reference*, look up the `filter` command in the "Commands" chapter; also look up `Class filter options` in the "Objects" chapter.

### VBS

```
appRef.docRef.ActiveLayer.ApplyGaussianBlur 5
```

**Note:** In the *Adobe Photoshop CS2 Visual Basic Scripting Reference*, look up `ApplyGaussianBlur` method and other methods whose name includes *filter* in the Methods table of the `ArtLayer` object in the "Interface" chapter.

### JS

```
docRef.activeLayer.applyGaussianBlur(5)
```

**Note:** In the *Adobe Photoshop CS2 JavaScript Scripting Reference*, look up `applyGaussianBlur()` method and other methods whose name includes *filter* in the Methods table of the `artLayer` object in the "Interface" chapter.

### Other Filters

If the filter type that you want to use on your layer is not part of the scripting interface, you can use the Action Manager from a JavaScript to run a filter. If you are using AppleScript, VBScript or VBScript, you can run the JavaScript from your script. Refer to the *Adobe Photoshop CS2 JavaScript Scripting Reference* for information on using the Action Manager. Also, see `'Executing JavaScripts from AS or VBS' on page 31`.

## Understanding Clipboard Interaction

The clipboard commands/methods in Photoshop CS2 operate on `ArtLayer` and `Selection` objects. The commands can be used to operate on objects within a single document, or to move information between documents.

The clipboard commands/methods of the art `layer/ArtLayer/ArtLayer` and `selection/Selection/Selection` objects are:

- `copy/Copy/copy()`
- `copy merged/Copy` *`Merge parameter value`*`/copy(`*`merge parameter value`*`)`
- `paste/Paste/paste()`
- `paste into/Copy` *`IntoSelection parameter value`*`/paste(`*`intoSelection parameter value`*`)`
- `cut/Cut/cut()`

**Note:** For information on copy, copy merged, paste, paste into, and cut functions, see Photoshop CS2 Help.

## Using the Copy and Paste Commands/Methods

The following examples copy the contents an the background layer to the clipboard, create a new document, and then paste the clipboard contents to the new document. The scripts assume that there is a document already open in Photoshop CS2 and that the document has a background layer.

**Note:** If your script creates a new document in which you paste the clipboard contents, be sure the document uses the same ruler units as the original document. See 'Setting Application Preferences' on page 46 for information.

### AS

**Note:** On Mac OS, Photoshop CS2 must be the front-most application when executing these commands. You must use the `activate` command to activate the application before executing any clipboard commands.

```
tell application “Adobe Photoshop CS2”
activate
select all of current document
set current layer of current document to layer "Background" of ¬
   current document
set newDocRef to make new document
past newDocRef
```

**Note:** In AppleScript, you must select the entire layer before performing the copy.

### VBS

```
//make firstDocument the active document
Set docRef = appRef.ActiveDocument
appRef.docRef.ArtLayers("Background").Copy

Set newDocRef = Documents.Add(8, 6, 72, "New Doc")
newDocRef.Paste
```

### JS

```
//make firstDocument the active document
var docRef = app.activeDocument
docRef.artLayers["Background"].copy()

var newDocRef = app.documents.add(8, 6, 72, "New Doc")
newDocRef.paste()
```

## Using the Copy Merged Command/Method

You can also perform a merged copy to copy of all visible layers in the selected area.

### AS

**Note:** On Mac OS, Photoshop CS2 must be the front-most application when executing these commands. You must use the `activate` command to activate the application before executing any clipboard commands.

```
activate
select all of current document
copy merged selection of current document
```

### VBS

In VBScript, you must use the `ArtLayer` or `Selection` object's `Copy` method with the `Merge` parameter. To perform the merged copy, you must enter, or *pass*, the value `true`, as in the following example.

```
docRef.Selection.Copy True
```

Look up the `Copy` method in the Methods table for the `ArtLayer` and `Selection` objects in the *Adobe Photoshop CS2 Visual Basic Scripting Reference*,

### JS

In JavaScript, you must use the `ArtLayer` or `Selection` object's `copy()` method with the `merge` parameter. To perform the merged copy, you must enter, or *pass*, the value `true`, as in the following example.

```
docRef.selection.copy(true)
```

Look up the `copy()` method in the Methods table for the `ArtLayer` and `Selection` objects in the *Adobe Photoshop CS2 JavaScript Scripting Reference*,

## Working with Units

Photoshop CS2 provides two rulers for documents. You can set the measurement units for the rulers in your script. The rulers are:

- A graphics ruler used for most graphical layout measurements or operations on a document where height, width, or position are specified.

  You set measurement unit types for the graphics ruler using the `ruler units (RulerUnits/rulerUnits)` property.
- A type ruler, which is active when using the type tool

  You set measurement unit types for the type ruler using the `type units (TypeUnits/typeUnits)` property.

**Note:** These settings correspond to those found in the Photoshop CS2 preference dialog under **Photoshop >Preferences > Units & Rulers** on Mac OS or **Edit >Preferences > Units & Rulers** in Windows.

### Unit Values

All languages support plain numbers for unit values. These values are treated as being of the type currently specified for the appropriate ruler.

For example, if the ruler units are currently set to inches and the following VBScript statement sets a document's size to 3 inches by 3 inches:

```
docRef.ResizeImage 3,3
```

If the ruler units had been set to pixels, the document would be 3 pixels by 3 pixels. To ensure that your scripts produce the expected results you should check and set the ruler units to the type appropriate for your script. After executing a script the original values of the rule settings should be restored if changed in the script. See `'Setting Ruler And Type Units in a Script' on page 71` for directions on setting unit values.

Please refer to Photoshop CS2 Help for information about available unit value types.

#### Special Unit Value Types

The unit values used by Photoshop CS2 are length units, representing values of linear measurement. Support is also included for pixel and percent unit values. These two unit value types are not, strictly speaking, length values but are included because they are used extensively by Photoshop CS2 for many operations and values.

### AppleScript Unit Considerations

AppleScript provides an additional way of working with unit values. You can provide values with an explicit unit type where unit values are used. When a typed value is provided its type overrides the ruler's current setting.

For example, to create a document which is 4 inches wide by 5 inches high you would write:

```
make new document with properties {width:inches 4, ¬
   height:inches 5}
```

The values returned for a Photoshop CS2 property which used units will be returned as a value of the current ruler type. Getting the height of the document created above:

```
set docHeight to height of current document
```

would return a value of 5.0, which represents 5 inches based on the current ruler settings.

In AppleScript, you can optionally ask for a property value as a particular type.

```
set docHeight to height of current document as points
```

This would return a value of 360 (5 inches x 72 points per inch).

The `points` and `picas` unit value types are PostScript points, with 72 points per inch. The `traditional points` and `traditional picas` unit value types are based on classical type setting values, with 72.27 points per inch.

You can convert, or coerce, a unit value from one value type to another. For example, the following script converts a point value to an inch value.

```
set pointValue to points 72
set inchValue to pointValue as inches
```

When this script is run, the variable `inchValue` will contain inches 1, which is 72 points converted to inches. This conversion ability is built in to the AppleScript language.

### Using Unit Values in Calculations

To use a unit value in a calculation it is necessary to first convert the value to a number (unit value cannot be used directly in calculations). To multiply an inch value write:

```
set newValue to (inchValue as number) * someValue
```

**Note:** In AppleScript you can get and set values as pixels or percent as you would any other unit value type. You cannot, however, convert a pixel or percent value to another length unit value as you can with other length value types. Trying to run the following script will result in an error.

```
set pixelValue to pixels 72
-- Next line will result in a coercion error when run
set inchValue to pixelValue as inches
```

**Note:** Because Photoshop CS2 is a pixel-oriented application you may not always get back the same value as you pass in when setting a value. For example, if `ruler units` is set to mm units, and you create a document that is 30 x 30, the value returned for the height or width will be 30.056 if your document resolution is set to 72 ppi. The scripting interface assumes settings are measured by ppi.

## Unit Value Usage

The following tables list the properties of the classes/objects that are defined to use unit values. Unit values for these properties, unless otherwise indicated in the table, are based the graphics ruler setting.

To use this table, do one of the following:

- Look up the class's properties in the "Objects" chapter of the *Adobe Photoshop CS2 AppleScript Scripting Reference*.
- Look up the property in the object's Properties table in the "Objects" chapter of the *Adobe Photoshop CS2 Visual Basic Scripting Reference* or the *Adobe Photoshop CS2 JavaScript Scripting Reference*.

| Class/Object | AppleScript Properties | VBScript Properties | JavaScript Properties |
|---|---|---|---|
| `Document` | `height`<br>`width` | `Height`<br>`Width` | `height`<br>`width` |
| `EPS open options` | `height`<br>`width` | `Height`<br>`Width` | `height`<br>`width` |
| `PDF open options` | `height`<br>`width` | `Height`<br>`Width` | `height`<br>`width` |
| `lens flare open options` | `height`<br>`width` | `Height`<br>`Width` | `height`<br>`width` |
| `offset filter` | `horizontal offset`<br>`vertical offset` | `HorizontalOffset`<br>`VerticalOffset` | `horizontalOffset`<br>`verticalOffset` |
| `Text Item` | `baseline shift*`<br>`first line indent*`<br>`height`<br>`hyphenation zone*`<br>`leading*`<br>`left indent*`<br>`position`<br>`right indent*`<br>`space before*`<br>`space after*`<br>`width` | `BaselineShift*`<br>`FirstLineIndent*`<br>`Height`<br>`HyphenationZone*`<br>`Leading*`<br>`LeftIndent*`<br>`Position`<br>`RightIndent*`<br>`SpaceBefore*`<br>`SpaceAfter*`<br>`Width` | `baselineShift*`<br>`firstLineIndent*`<br>`height`<br>`hyphenationZone*`<br>`leading*`<br>`leftIndent*`<br>`position`<br>`rightIndent*`<br>`spaceBefore*`<br>`spaceAfter*`<br>`width` |

* Unit values based on type ruler setting.

The following table lists the commands/methods that use unit values as parameters or arguments.In some cases the parameters are required. The VBScript and JavaScript methods are preceded by the ojbect to which they belong.

To use this table:

- For AppleScript commands, look up the command in the "Commands" chapter of the *Adobe Photoshop CS2 AppleScript Scripting Reference*.
- For VBScript methods, look up the method in the Methods table of the object in the "Interface" chapter of the *Adobe Photoshop CS2 Visual Basic Scripting Reference*.
- For JavaScript methods, look up the method in the Methods table of the object in the "Interface" chapter in the *Adobe Photoshop CS2 JavaScript Scripting Reference*.

| AppleScript | VBScript | JavaScript |
|---|---|---|
| `crop (bounds, height, width)` | `Document.Crop (Bounds, Height, Width)` | `document.crop (bounds, height, width)` |
| `resize canvas (height, width)` | `Document.ResizeCanvas (Height, Width)` | `document.resizeCanvas (height, width)` |

| AppleScript | VBScript | JavaScript (Continued) |
|---|---|---|
| `resize image (height, width)` | `Document.ResizeImage (Height, Width)` | `document.resizeImage (height, width)` |
| `contract (by)` | `Selection.Contract (By)` | `selection.contract (by)` |
| `expand (by)` | `Selection.Expand (By)` | `selection.expand (by)` |
| `feather (by)` | `Selection.Feather (By)` | `selection.feather (by)` |
| `select border (width)` | `Selection.SelectBorder (Width)` | `selection.selectBorder (width)` |
| `translate (delta x, delta y)` | `Selection.Translate (DeltaX, DeltaY)` | `selection.translate (deltaX, deltaY)` |
| `translate boundary (delta x, delta y)` | `Selection.TranslateBoundary (DeltaX, DeltaY)` | `selection.translateBoundary (deltaX, deltaY)` |

## Setting Ruler And Type Units in a Script

The unit type settings of the two Photoshop CS2 rulers control how numbers are interpreted when dealing with properties and parameters that support unit values. Be sure to set the ruler units as needed at the beginning of your scripts and save and restore the original ruler settings when your script has completed.

In AppleScript `ruler units` and `type units` are properties of the `settings-object`, accessed through the Application object's `settings` property as shown below.

```
set ruler units of settings to inch units
set type units of settings to pixel units
set point size of settings to postscript size
```

In VBScript and JavaScript `ruler units` and `type units` are properties of the `Preferences`, accessed through the `Application` object's preferences property as shown below.

### VBS

```
appRef.Preferences.RulerUnits = 2 'for PsUnits --> 1 (psInches)
appRef.Preferences.TypeUnits = 1 'for PsTypeUnits --> 1 (psPixels)
appRef.Preferences.PointSize = 2
'2 indicates psPointType --> 2 (PsPostScriptPoints)
```

### JS

```
app.preferences.rulerUnits = Units.INCHES
app.preferences.typeUnits = TypeUnits.PIXELS
app.preferences.pointSize = PointType.POSTSCRIPT
```

**Note:** Remember to reset the unit settings back to the original values at the end of a script. See `'Working with Document Preferences' on page 72` for an example of how to do this.

## Sample Workflow Automation JavaScripts

The following sample workflow automation JavaScripts are provided with Photoshop CS2 and demonstrate various kinds of scripting usage. The scripts are located in the `Presets/Scripts` folder in your application directory. See `Creating and Running a JavaScript` for information on the `Presets/Scripts` folder.

| Script Name | Description |
|---|---|
| `Layer Comps to Files.jsx` | Saves layer comps as files. |
| `Layer Comps to PDF.jsx` | Saves layer comps as a PDF presentation. |
| `Layer Comps to WPG.jsx` | Saves layer comps as a Web photo gallery. |
| `Export Layers to Files.jsx` | Exports each document in the document to a separate file. |
| `Script Events Manager.jsx` | Enables and disables notifier objects. |
| `Image Processor.jsx` | Processes camera raw images in various file formats. |

## Advanced Scripting

This section demonstrates how to use the information contained in the previous sections of this chapter to create scripts that do the following:

- Configure document preferences.
- Apply color to text items. In this section, you will also learn how to do the following:
  - Create a reference to an existing document.
  - Create a layer object and make the layer a text layer.
- Rasterize text so that *wrap* and *blur* processing can be applied to words. In these sections you will also learn how to do the following:
  - Select and work with a specific area of a layer by creating a selection object.
  - Apply wave and motion blur filters to selected text.

**Note:** When you finish the lesson in each of the following sections, save the script you have created in the lesson. Each lesson builds upon the script created in the previous lesson.

### Working with Document Preferences

The sample scripts in this section activate a Photoshop CS2 Application object and then save the default configuration settings into variables so that they can be restored later when the script completes. These are the default configurations you most probably set up in the Preferences dialog when you initially installed and configured Photoshop CS2.

**Note:** To view or set the Preferences on Mac OS, choose **Photoshop >Preferences> Units & Rulers**; in Windows choose **Edit >Preferences> Units & Rulers**.

Next, the scripts set the following preferences to the following values:

| Preference | Set to | What it does |
|---|---|---|
| rulers | inches | Uses inches as the unit of measurement for graphics |

| Preference | Set to | What it does (Continued) |
|---|---|---|
| units | pixels | Uses pixels as the unit of measurement for text (type) |
| dialog modes | never | Suppresses the use of dialogs so that your script executes without the user being asked for input (such as clicking an OK button) at various stages of the process.<br><br>**Note:** dialog modes is not an option in the Photoshop CS2 application. |

Next, variables are declared that store document dimensions in inches and document resolution in pixels. A display resolution is declared and the text "Hello, World!" is assigned to a string variable.

Finally, an `if` statement checks whether a `Document` object has been created and then creates a new `Document` object if none exists.

## AS

### ➤ To work with document preferences:

1. Create and run the following script. See 'Creating and Running an AppleScript' on page 22 for details.

```
tell application "Adobe Photoshop CS2"

   --make Photoshop CS2 the active (front-most) application
   activate

   --create variables for the default settings
   set theStartRulerUnits to ruler units of settings
   set theStartTypeUnits to type units of settings
   set theStartDisplayDialogs to display dialogs

   --change the settings
   set ruler units of settings to inch units
   set type units of settings to pixel units
   set display dialogs to never

   --create variables for default document settings
   set theDocWidthInInches to 4
   set theDocHeightInInches to 2
   set theDocResolution to 72
   set theDocString to "Hello, World!"
```

```
    --check to see whether any documents are open
    --if none are found, create a document
    --use the default document settings as its properties
    if (count of documents) is 0 then
       make new document with properties ¬
       {width:theDocWidthInInches, height:theDocHeightInInches,¬
       resolution:theDocResolution, name:theDocString}
    end if

    --change the settings back to the original units stored in the variables
    set ruler units of settings to theStartRulerUnits
    set type units of settings to theStartTypeUnits
    set display dialogs to theStartDisplayDialogs

end tell
```

2. In Photoshop CS2, choose **Photoshop > Preferences > Units & Rulers** to verify that your preferences have been returned to your original settings.
3. After viewing the document in Photoshop CS2, close the document without saving it.
4. To prepare the script for the next section, comment the statements that restore the beginning preferences by adding hyphens as follows:

```
    --set ruler units of settings to theStartRulerUnits
    --set type units of settings to theStartTypeUnits
```

5. Save the script as `HelloWorldDoc`.

## VBS

**➤ To work with document preferences:**

1. Create the following script. See 'Creating and Running a VBScript' on page 23 for details.

```
Private Sub CommandButton1_Click()

   'create variables for default preferences, new preferences
   Dim startRulerUnits
       Dim startTypeUnits
       Dim docWidthInInches
       Dim docHeightInInches
       Dim resolution
       Dim helloWorldStr
   Dim appRef
   Set appRef = CreateObject("Photoshop.Application")

   'target Photoshop CS2
   Set appRef = New Photoshop.Application

   'assign default preferences to save values in variables
startRulerUnits = appRef.Preferences.RulerUnits
startTypeUnits = appRef.Preferences.TypeUnits
startDisplayDialogs = appRef.DisplayDialogs

   'set new preferences and document defaults
   appRef.Preferences.RulerUnits = 2 'for PsUnits --> 2 (psInches)
   appRef.Preferences.TypeUnits = 1 'for PsTypeUnits --> 1 (psPixels)
   appRef.DisplayDialogs = 3 'for PsDialogModes --> 3 (psDisplayNoDialogs)
   docWidthInInches = 4
        docHeightInInches = 2
        resolution = 72
        helloWorldStr = "Hello, World!"
'see if any documents are open
   'if none, create one using document defaults
   If appRef.Documents.Count = 0 Then
            app.Documents.Add docWidthInInches, docHeightInInches, resolution,
helloWorldStr
        End If

   'restore beginning preferences
   appRef.Preferences.RulerUnits = startRulerUnits
   appRef.Preferences.TypeUnits = startTypeUnits
   appRef.DisplayDialogs = startDisplayDialogs
End Sub
```

2. Choose **Run > Run Sub/UserForm** or press F5 to run the script.
3. In Photoshop CS2, choose **Edit > Preferences > Units & Rulers** to verify that your preferences have been returned to your original settings.
4. After viewing the document in Photoshop CS2, close the document without saving it.
5. To prepare the script for the next section, comment the statements that restore the beginning preferences by adding straight single quotes as follows:

```
'app.Preferences.RulerUnits = startRulerUnits
'app.Preferences.TypeUnits = startTypeUnits
```

6. Name the script `HelloWorldDoc` and save it.

## JS

**➤ To work with document preferences:**

1. Create the following script.

**Note:** See 'Creating and Running a JavaScript' on page 24 for details on creating a JavaScript.

```
//create and assign variables for default preferences
startRulerUnits = app.preferences.rulerUnits
startTypeUnits = app.preferences.typeUnits
startDisplayDialogs = app.displayDialogs

//change settings
app.preferences.rulerUnits = Units.INCHES
app.preferences.typeUnits = TypeUnits.PIXELS
app.displayDialogs = DialogModes.NO

//create and assign variables for document settings
docWidthInInches = 4
docHeightInInches = 2
resolution = 72

//use the length property of the documents object to
//find out if any documents are open
//if none are found, add a document
```

```
if (app.documents.length == 0)
   app.documents.add(docWidthInInches, docHeightInInches, resolution)

   //restore beginning preferences
   app.preferences.rulerunits = startRulerUnits
   app.preferences.typeunits = startTypeUnits
   app.displayDialogs = startDisplayDialogs
```

2. Name the script `HelloWorldDoc.jsx` and save it in the Scripts folder.
3. Open Photoshop CS2 and choose **File > Scripts > HelloWorldDoc** to run the script.
4. Choose **Edit > Preferences > Units & Rulers** to verify that your preferences have been returned to your original settings.
5. After viewing the document in Photoshop CS2, close the document without saving it.
6. To prepare the script for the next section, comment the statements that restore the beginning preferences by adding slashes as follows:

```
   //app.preferences.rulerunits = startRulerUnits
   //app.preferences.typeunits = startTypeUnits
```

7. Save the script.

## Applying Color to a Text Item

In this section, we will add a layer to the `HelloWorldDoc` script, then change the layer to a text object that displays the text *Hello, World!* in red.

Before you begin, do the following:

- Make sure Photoshop CS2 is closed.
- Open the script file `HelloWorldDoc` in your script editor application.

### AS

➤ **To create and specify details in a text item:**

1. Type the following code into the `HelloWorldDoc` script immediately before the commented statements that restore original preferences.

```
--create a variable named theDocRef
--assign the current (active) document to it
set theDocRef to the current document

--create a variable that contains a color object of the RGB color class
--whose color is red
set theTextColor to {class:RGB color, red:255, green:0, blue:0}

--create a variable for the text layer, create the layer as an art layer object
--and use the kind property of the art layer object to make it a text layer
set theTextLayer to make new art layer in theDocRef with¬
   properties {kind:text layer}

--Set the contents, size, position and color of the text layer
set contents of text object of theTextLayer to "Hello, World!"
set size of text object of theTextLayer to 36
set position of text object of theTextLayer to {0.75, 1}
set stroke color of text object of theTextLayer to theTextColor
```

2. Run the complete script. Be patient while Photoshop CS2 executes your commands one by one.
3. After viewing the document in Photoshop CS2, close the document without saving it.

**Note:** Look up the following classes in the *Adobe AppleScript Scripting Reference* to see if you understand how you used them in this script:

- `RGB color class`
- `Art Layer class`

## VBS

**➤ To create and specify details in a text item:**

1. Type the following code into the `HelloWorldDoc` script immediately before the commented statements that restore original preferences.

```
'create a reference to the active (current) document
Set docRef = app.ActiveDocument

' create a variable named textColor
'create a SolidColor object whose color is red
'assign the object to textColor
Set textColor = CreateObject ("Photoshop.SolidColor")
textColor.RGB.Red = 255
textColor.RGB.Green = 0
textColor.RGB.Blue = 0

'create an art layer object using the
'Add method of the ArtLayers class
'assign the layer to the variable newTextLayer
Set newTextLayer = docRef.ArtLayers.Add()

'use the Kind property of the Art Layers class to
'make the layer a text layer
newTextLayer.Kind = 2
newTextLayer.TextItem.Contents = helloWorldStr
newTextLayer.TextItem.Position = Array(0.75, 1)
newTextLayer.TextItem.Size = 36
newTextLayer.TextItem.Color = textColor
```

2. Run the complete script. Be patient while Photoshop CS2 executes your commands one by one.
3. After viewing the document in Photoshop CS2, close the document without saving it.

**Note:** Look up the following classes in the *Adobe VBScript Scripting Reference* "Object Reference" chapter to see if you understand how you used them in this script:

- `SolidColor`
- `ArtLayer`

### JS

**➤ To create and specify details in a text item:**

1. Type the following code into the `HelloWorldDoc` script immediately before the commented statements that restore original preferences.

```
//create a reference to the active document
docRef = app.activeDocument

//create a variable named textColor
//create a SolidColor object whose color is red
//assign the object to textColor
textColor = new SolidColor
textColor.rgb.red = 255
textColor.rgb.green = 0
textColor.rgb.blue = 0

helloWorldText = "Hello, World!"

//create a variable named newTextLayer
//use the add() method of the artLayers class to create a layer object
//assign the object to newTextLayer
newTextLayer = docRef.artLayers.add()

//use the kind property of the artLayer class to make the layer a text layer
newTextLayer.kind = LayerKind.TEXT

newTextLayer.textItem.contents = helloWorldText
newTextLayer.textItem.position = Array(0.75, 1)
newTextLayer.textItem.size = 36
newTextLayer.textItem.color = textColor
```

2. Save the script, and then open Photoshop CS2 and select the script from the Scripts menu (choose **File > Script > HelloWorldDoc**). Be patient while Photoshop CS2 executes your commands one by one.

3. After viewing the document in Photoshop CS2, close Photoshop CS2 without saving the document.

**Note:** Look up the following classes in the *Adobe JavaScript Scripting Reference* "Object Reference" chapter to see if you understand how you used them in this script:

- `SolidColor`
- `ArtLayer`. Notice that the `LayerKind.TEXT` value of the kind property uses the `LayerKind` constant. Constants are always depicted in upper case letters in Photoshop CS2 JavaScripts.

## Applying a Wave Filter

In this section we'll apply a wave filter to the word *Hello* in our document. This entails the following steps:

- Set the document width and height to pixels and then rasterize the text object in the Text Layer.

**Note:** Because text is a vector graphic and cannot apply a wave filter to vector graphics, we must first convert the image to a bitmap. Rasterizing converts mathematically defined vector artwork to pixels. For more information on rasterizing, refer to Photoshop CS2 Help.

- Select the area of the layer to which we want to apply the wave filter.

  **Note:** See `Defining the Area of a Selection Object` in order to understand the code within the script that accomplishes this task.

- Apply a wave filter to the selection.

  **Note:** The wave is a truncated sine curve.

## Defining the Area of a Selection Object

To define the area of a selection object, we will create an array of coordinates, or points specified in pixels within the document. The array indicates the coordinates that define the outside corners of a rectangular area that begins at the top left corner of the document and extends half way across the document.

**Note:** You can define any number of points for a selected area. The number of coordinates determines the shape of the selection. The last coordinate defined must be the same as the first so that the area.

**Note:** See `'Photoshop CS2's Object Model' on page 8` for information on selection objects and other Photoshop CS2 objects.

The array values in order are:

- Upper left corner of the selection: `0,0`
  - `0` indicates the left-most column in the document.
  - `0` indicates the top row in the document.
- Upper right corner of the selection: `theDocWidthInPixels / 2, 0`
  - `theDocWidthInPixels / 2` indicates the column in the middle of the document; that is, the column whose coordinate is the total number of columns in the document divided by 2.

    **Note:** The value of `theDocWidthInPixels` is the total number of pixels that defines the document's horizontal dimension. Columns are arranged horizontally.
  - `0` indicates the top row in the document.
- Lower right corner: `theDocWidthInPixels / 2, theDocHeightInPixels`
  - `theDocWidthInPixels / 2` indicates the middle of the document.
  - `theDocHeightInPixels` indicates the bottom row in the document; that is row whose coordinate is the total number of rows in the document.

    **Note:** The value of `theDocHeightInPixels` is the total number of pixels that determine the vertical dimension of the document. Rows are stacked vertically.
- Lower left corner: `theDocWidthInPixels / 2, 0`
  - `theDocWidthInPixels / 2`
  - `0`
- Upper left corner of the selection: `0,0`

## AS

➤ **To select an area and apply a wave filter to it:**

1. Type the following code into the script file `HelloWorldDoc` just above the commented statements that restore original preferences:

```
--create new variables to contain the document object's width and height
--determine width and height values by multiplying the
--width and height in inches by the resolution
--(which equals the number of pixels per inch)
```

```
set theDocWidthInPixels to theDocWidthInInches *¬
   theDocResolution
set theDocHeightInPixels to theDocHeightInInches *¬
   theDocResolution

--use the rasterize command of the art layer object
rasterize theTextLayer affecting text contents

--create a variable named theSelRegion
--assign an array of coordinates as its value
set theSelRegion to {{0, 0}, ¬
   {theDocWidthInPixels / 2, 0}, ¬
   {theDocWidthInPixels / 2, theDocHeightInPixels}, ¬
   {0, theDocHeightInPixels}, ¬
   {0, 0}}

--replace the document object with the selection object
--so that the wave is applied only to the selected text
select theDocRef region theSelRegion combination type replaced

--apply the wave filter using the filter command of the
--wave filter class (inherited from the filter options super class)
filter current layer of theDocRef using wave filter ¬
   with options {class:wave filter, number of generators:1 ¬
   , minimum wavelength:1, maximum wavelength:100, ¬
   minimum amplitude:5, maximum amplitude:10 ¬
   , horizontal scale:100, vertical scale:100 ¬
   , wave type:sine, undefined areas:repeat edge pixels,¬
   random seed:0}
```

2. Choose **Run** to run the script.

3. After viewing the document in Photoshop CS2, close the document without saving it.

4. Save the script in the Script Editor.

**Note:** Look up the following classes in the *Adobe AppleScript Scripting Reference* to see if you understand how you used them in this script:

- `wave filter class`
- `art layer class`
  - `rasterize` command
  - `filter` command
- `document class` > `select` command, `combination type` parameter

## VBS

### ➤ To select an area and apply a wave filter to it:

1. Type the following code into the script file `HelloWorldDoc` just above the commented statements that restore original preferences:

```
'create new variables to contain doc width and height
'convert inches to pixels by multiplying the number of inches by
'the resolution (which equals number of pixels per inch)
docWidthInPixels = docWidthInInches * resolution
docHeightInPixels = docHeightInInches * resolution
```

```
'use the Rasterize() method of the ArtLayer class to
'convert the text in the ArtLayer object (contained in the newTextLayer variable)
'to postscript text type
newTextLayer.Rasterize (1)

'create an array to define the selection property
'of the Document object
'define the selected area as an array of points in the document
docRef.Selection.Select Array(Array(0, 0), _
   Array(docWidthInPixels / 2, 0), _
   Array(docWidthInPixels / 2, docHeightInPixels), _
   Array(0, docHeightInPixels), Array(0, 0))

'use the ApplyWave() method of the ArtLayer class
'to apply the wave of the selected text
newTextLayer.ApplyWave 1, 1, 100, 5, 10, 100, 100, 1, 1, 0
```

2. Choose **Run > Run Sub/Userform** or press F5 to run the script.
3. After viewing the document in Photoshop CS2, close the document without saving it.
4. Save the script.

**Note:** Look up the following classes in the *Adobe VBScript Scripting Reference* to see if you understand how you used them in this script:

- `ArtLayer` class
  - `ApplyWave()` method
  - `Rasterize()` method
- `Selection` class > `Select()` method

## JS

### ➤ To select an area and apply a wave filter to it:

1. Type the following code into the script file `HelloWorldDoc` just above the commented statements that restore original preferences:

```
//create new variables to contain doc width and height
//convert inches to pixels by multiplying the number of inches by
//the resolution (which equals number of pixels per inch)
docWidthInPixels = docWidthInInches * resolution
docHeightInPixels = docHeightInInches * resolution
//use the rasterize method of the artLayer class
newTextLayer.rasterize(RasterizeType.TEXTCONTENTS)

//create a variable to contain the coordinate values
//for the selection object
selRegion = Array(Array(0, 0),
   Array(docWidthInPixels / 2, 0),
   Array(docWidthInPixels / 2, docHeightInPixels),
   Array(0, docHeightInPixels),
   Array(0, 0))

//use the select method of the selection object
//to create an object and give it the selRegion values
//as coordinates
```

```
docRef.selection.select(selRegion)

//
newTextLayer.applyWave(1, 1, 100, 5, 10, 100, 100,
   WaveType.SINE, UndefinedAreas.WRAPAROUND, 0)
```

2. Save the script, and then open Photoshop CS2 and select the script from the Scripts menu (choose **File > Script > HelloWorldDoc**).

3. After viewing the document in Photoshop CS2, close Photoshop CS2 without saving the document.

**Note:** Look up the following classes in the *Adobe JavaScript Scripting Reference* "Object Reference" chapter to see if you understand how you used them in this script:

- `ArtLayer`
  - `Rasterize()` method. Notice that the `RasterizeType.TEXTCONTENTS` argument uses the `RasterizeType` constant. Constants are always depicted in upper case letters in Photoshop CS2 JavaScripts.
  - `applyWave()` method

## Applying a MotionBlur Filter

In this section, we will apply a different filter to the other half of our document.

Additionally, because this is the last exercise in this that deals with our Hello World document, we will uncomment the statements that reset our original application preferences for rulers and units.

### AS

#### ➤ To apply a motionblur filter to HelloWorldDoc:

1. Type the following code into the script file `HelloWorldDoc` just above the commented statements that restore original preferences.

```
--change the value of the variable theSelRegion
--to contain the opposite half of the screen
set theSelRegion to {{theDocWidthInPixels / 2, 0},¬
   {theDocWidthInPixels, 0}, ¬
   {theDocWidthInPixels, theDocHeightInPixels}, ¬
   {theDocWidthInPixels / 2, theDocHeightInPixels}, ¬
   {theDocWidthInPixels / 2, 0}}

select theDocRef region theSelRegion combination type replaced

filter current layer of theDocRef using motion blur ¬
   with options {class:motion blur, angle:45, radius:5}

deselect theDocRef
```

2. Delete the hyphens from the commented statements immediately above the end tell statement as follows:

```
app.Preferences.RulerUnits = startRulerUnits
app.Preferences.TypeUnits = startTypeUnits
```

3. Choose **Run** to run the script.

**Note:** Look up the `motion blur class` in the *Adobe AppleScript Scripting Reference* to see if you understand how you used it in this script:

## VBS

### ➤ To apply a motionblur filter to HelloWorldDoc:

1. Type the following code into the script file `HelloWorldDoc` just above the commented statements that restore original preferences.

```
docRef.Selection.Select Array(Array(docWidthInPixels / 2, 0), _
   Array(docWidthInPixels, 0), _
   Array(docWidthInPixels, docHeightInPixels), _
   Array(docWidthInPixels / 2, docHeightInPixels), _
   Array(docWidthInPixels / 2, 0))

newTextLayer.ApplyMotionBlur 45, 5

docRef.Selection.Deselect
```

2. Delete the straight single quotes from the commented statements above the end tell statement as follows:

```
app.Preferences.RulerUnits = startRulerUnits
app.Preferences.TypeUnits = startTypeUnits
```

3. Choose **Run > Run Sub/Userform** or press F5 to run the script.

**Note:** Look up the `ArtLayer` class > `ApplyMotionBlur()` method in the *Adobe VBScript Scripting Reference* to see if you understand how you used it in this script:

## JS

### ➤ To apply a motionblur filter to HelloWorldDoc:

1. Type the following code into the script file `HelloWorldDoc` just above the commented statements that restore original preferences.

```
//change the value of selRegion to the other half of the document
selRegion = Array(Array(docWidthInPixels / 2, 0),
   Array(docWidthInPixels, 0),
   Array(docWidthInPixels, docHeightInPixels),
   Array(docWidthInPixels / 2, docHeightInPixels),
   Array(docWidthInPixels / 2, 0))

docRef.selection.select(selRegion)

newTextLayer.applyMotionBlur(45, 5)

docRef.selection.deselect()
```

2. Delete the slashes from the commented statements above the end tell statement as follows:

```
app.preferences.rulerUnits = startRulerUnits
app.preferences.typeUnits = startTypeUnits
```

3. Save the script, and then open Photoshop CS2 and select the script from the Scripts menu (choose **File > Script > HelloWorldDoc**).

**Note:** Look up the `ArtLayer` class `applyMotionBlur()` method in the *Adobe JavaScript Scripting Reference* “Object Reference” chapter to see if you understand how you used it in this script:

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