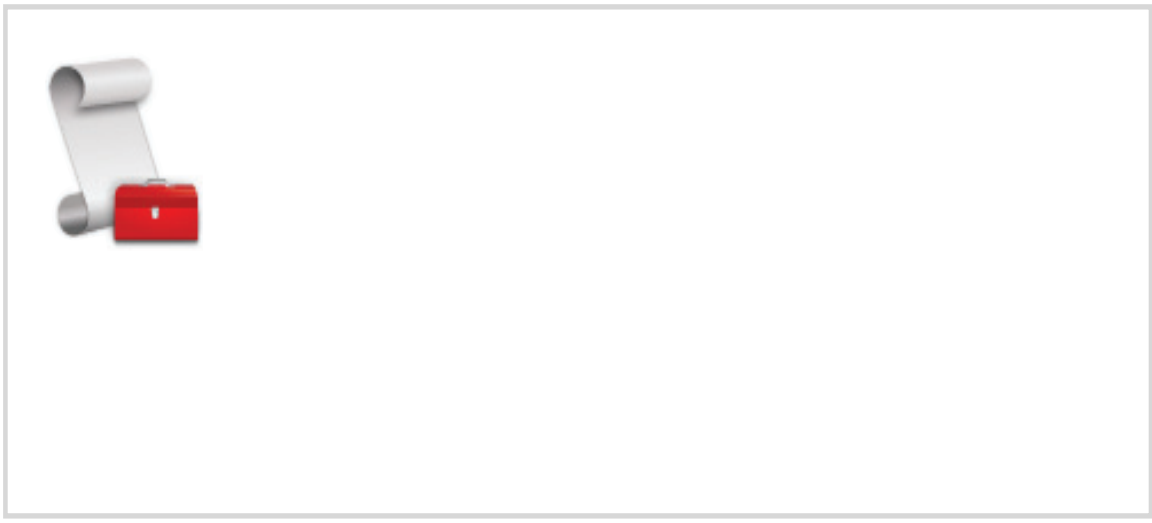

ADOBE®
INTRODUCTION TO SCRIPTING

Adobe®

Introduction to Scripting for Windows® and Macintosh®.

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Contents

1 Introduction

Scripting is a powerful tool that can be used to control and automate many features of many Adobe® applications—saving you so much time and effort that it can completely change the way you approach your work.

Isn't scripting difficult to learn?

Scripting isn't programming. You don't need a degree in computer science or mathematics to write basic scripts that automate a wide variety of common tasks.

Each scripting item corresponds to a tool or a palette or menu item in an Adobe application. In other words, each scripting element is something you already know through your Adobe expertise. If you know what you'd like your Adobe applications to do, you can easily learn to write scripts.

Why use scripting?

Your work is characterized by creativity, but many of the actual hands-on tasks are anything but creative. Most likely, you spend a lot of time doing the same or similar procedures over and over again.

Wouldn't it be great to have an assistant—one that happily does the mind-numbing tasks, follows your instructions with perfect and predictable consistency, is available any time you need help, works at lightning speed, and never even sends an invoice?

Scripting can be that assistant. With a small investment of time, you can learn to script the simple but repetitive tasks that eat up your time. However, while it's easy to get started, modern scripting languages provide the necessary depth to handle very sophisticated jobs. As your scripting skills grow, you may move on to more complex scripts that work all night while you're sleeping.

How do I know when to use scripting?

Think about your work—is there a repetitive task that's driving you crazy? If so, you've identified a candidate for a script. Next, you simply figure out:

- What are the steps involved in performing the task?
- What are the conditions in which you need to do the task?

Once you understand the process you go through to perform the task manually, you are ready to turn it into a script.

What about actions or macros?

If you have used Actions or written macros, you have some idea of the efficiency of using scripts. But scripting goes beyond the capability of Actions or macros by allowing you to manipulate multiple documents and multiple applications in a single script. For example, you can write a script that manipulates an image in Photoshop and then tells InDesign to incorporate the image.

Additionally, your script can very cleverly get and respond to information. For example, you may have a document that contains photos of varying sizes. You can write a script that figures out the size of each photo and creates a different colored border based on the size, so that icons have blue borders, small illustrations have green borders, and half-page pictures have silver borders.

If you like using Actions, keep in mind that your script can execute Actions within the application.

Okay, so—what exactly is scripting?

A script is a series of statements that tells an application to perform a set of tasks.

The trick is writing the statements in a language that the applications understand. Scriptable Adobe applications support several scripting languages.

If you work in Mac OS®, your choices are:

- AppleScript
- JavaScript

If you work in Windows®, your choices are:

- VBScript (Visual Basic and VBA will also work)
- JavaScript

The brief descriptions below can help you decide which language will work best for you.

AppleScript

AppleScript is a "plain language" scripting language developed by Apple. It is considered one of the simplest scripting languages to use.

To write AppleScript scripts, you can use Apple's Script Editor application, which, in a default Mac OS installation, is located at:

system drive:Applications:AppleScript:Script Editor

For information about using Script Editor, please refer to Script Editor Help.

JavaScript

JavaScript is a very common scripting language developed originally to make Web pages interactive. Like AppleScript, JavaScript is easy to learn.

Note: Adobe has developed an extended version of JavaScript, called ExtendScript, that allows you to take advantage of certain Adobe tools and scripting features. As a beginner, the difference between these two languages will not affect you. However, you should get in the habit of giving your JavaScript scripts a .jsx extension, rather than the usual .js extension.

JavaScript has a few small advantages over AppleScript and Visual Basic:

- Your scripts can be used in either Windows or Mac OS. If there's a chance you'll want to share or use your scripts on both platforms, you should learn to use JavaScript.
- In Illustrator and InDesign, you can access scripts in any of the supported languages from within the application. However, in Photoshop, you can access only .jsx files from within the application. You must run AppleScript or Visual Basic scripts from outside the application. This is not a major drawback, but it does require a few extra mouse clicks to run your scripts.
- You can set up .jsx scripts to run automatically when you open the application by placing the scripts in the application's Startup Scripts folder. For information on startup script folders, refer to the scripting guide for your application.

To write scripts in JavaScript, you can use any text editor, or you can use the ESTK (ExtendScript Tool Kit) provided with your Adobe applications. The ESTK has many features that make it easier to use than a text editor, including a built-in syntax checker that identifies where the problems are in your script and tries to

explain how to fix them, and the ability to run your scripts right from the ESTK without saving the file. This second feature can save you a lot of time, especially in the beginning when you may have to test and edit a script more than a few times to get it to work.

In a default Adobe installation, the ESTK is in the following location:

- In Mac OS:

  system drive:Applications:Utilities:Adobe Utilities:ExtendScript Toolkit 2

- In Windows:

  system drive:/Program Files/Adobe/Adobe Utilities/ExtendScript Toolkit 2

For details, see the *JavaScript Tools Guide*.

VBScript

VBScript is a scaled-down version of the Visual Basic programming language developed by Microsoft. VBScript talks to host applications using ActiveX Scripting. While VBScript is the Visual Basic language version officially supported by CS3, you can also write scripts in VBA and Visual Basic itself.

You can find several good VBScript editors on the Internet. If you have any Microsoft Office applications, you can also use the built in Visual Basic editor by selecting Tools > Macro > Visual Basic Editor.

How do I begin?

It's time to write your first script.

Note: If you have problems running your script, see Chapter 5, "Troubleshooting" on page 47.

AS

1. Open the Script Editor and type the following (substituting any Adobe application name in the quotes):

```
tell application "Adobe Photoshop CS3"
   make document
end tell
```

2. Press **Run**.

JS

1. Open the ESTK and select an application from the drop-down list in the upper left corner of a document window.

2. In the JavaScript Console palette, type the following:

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

3. Do any of the following:
   - Click the Run icon in the toolbar at the top of the Document window.
   - Press **F5**.
   - Choose **Debug -> Run**.

VBS

1. In a text editor, type the following (substituting any Adobe application in the quotes in the second line):

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

2. Save the file as a text file with a .vbs extension (for example, create_doc.vbs).

3. Double-click the file in Windows Explorer.

2 Scripting basics

This chapter covers the basic concepts of scripting in both Windows and Mac OS. For product-specific directions, see the scripting guide for your Adobe application.

The building blocks of scripting

Your first script, which created a new document, was constructed like an English sentence, with a noun (`document`) and a verb (`make` in AS, `add()` in JS, and `Add` in VBS). In scripting, a noun is called an *object*, and a verb is called a *command* (in AS) or a *method* (in JS and VBS).

Just as you can modify a noun using adjectives, you can modify a script object using *properties*. To modify a command or method, you use *parameters*.

Understanding objects, properties, methods, and commands

When you use an Adobe application, you open a file or document, and then, within the document, you create or manipulate layers, text, frames, channels, graphic lines, colors, and other design elements. These things are objects.

To create a script statement, you create an object or refer to an existing object, and then you do one of the following:

- Define values for the object's properties. For example, you can specify a document's name, height, or width. You can specify a layer's name, color, or opacity.
- Specify commands or methods that tell the script to do what to your objects. For example, you can open, close, save, and print a document. You can merge, move, or rasterize a layer.

The thing to remember when writing a script is that you can use only the properties or methods/commands that are allowed for the object. How do you know which properties and methods go with which object? For the most part, it's logical. Generally, if you can specify something in your Adobe application, you can specify it in a script.

However, Adobe also spells it out for you in great detail in scripting resources that contain the information you need to create, define, and manipulate scripting objects. For information on locating and using these resources, see Chapter 3, "Finding an object's properties and methods" on page 31.

Using Objects

The main concept to understand when using objects in scripts is how to refer to an object. How do you let the application know which object you want your script to change? In the application's user interface, you can simply select the object by clicking it. In a script, there's a little bit more to it.

DOM Concepts

Scripting languages use something called a *Document Object Model* (DOM) to organize objects in a way that makes the objects easy to identify. The principle behind a DOM is the *containment hierarchy*. In other words, top level objects *contain* next level objects, which contain the subsequent level of objects, and so on.

For example, the top level object in any Adobe application DOM is the application object. Next is the document object, which contains all other objects, such as layers, channels, pages, text frames, and so on. These objects can contain objects that the document cannot contain directly. For example, in InDesign or Illustrator, a text frame can contain words. A document cannot contain words unless it has a text frame. Similarly, in Photoshop, a document can contain a layer, and a layer can contain a text frame, but a document cannot contain a text frame unless the document contains a layer.

Note: An object's containing object is also called its *parent* object.

In your first script, you first named the application object (or selected it in the ESTK), and then you created the document within that application. If, as your next step, you wanted to create a layer, your script would need to identify the document in which you want to create the layer. If your script does not tell the application exactly where to create an object, your script fails.

Note: To view a chart of the DOM for a specific application, please refer to the application's scripting guide.

So, using your DOM principle, how would you add a layer in a document? (To modify this script for Photoshop, please note that a layer is called `art layer` in AS; and layers are called `artLayers` in JS or `ArtLayers` in VBS).

AS

```
tell application "Adobe Illustrator CS3"
   make document
   make layer in document
end tell
```

JS

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

VBS

```
Set appRef = CreateObject("Illustrator.Application")
docRef.Documents.Add
appRef.Documents.Layers.Add
```

If you try to run these scripts, you get an error because the application does not know which document you mean. Sure, you have only one document open, but that won't always be the case. Therefore, scripting languages have strict requirements that all objects be explicitly identified in every script statement.

This guide introduces three ways to refer to objects:

- Variables
- Collection or element numbers
- The "current" object or "active" object property

Variables

A *variable* is a thing that you create to hold data in your script. The data, called the variable's *value*, can be an object in your script, or it can be a property that describes an object. You could almost think of a variable as a nickname that you give to an object or other data.

Using a variable to contain an object makes an object easy to refer to. Most scripters create a variable for each object in their script.

The following scripts create a document, just as you did in your first script. However, this version of the script creates a variable named `myDoc` to contain the document. Take a look at these scripts, and then compare them to your first script. (See "How do I begin?" on page 7.)

AS

To create a variable in AS, you use the command `set`, followed by the variable name. To assign a data value to the variable, you use `to` followed by the value.

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
end tell
```

JS

To create a variable in JS, you use `var`, followed by the variable name. To assign a data value, you use an equal sign (=) followed by the value. Spaces do not matter on either side of the equal sign.

```
var myDoc = app.documents.add()
```

VBS

To create a variable in VBS, you use the command `Set`, followed by the variable name. To assign a data value, you use an equal sign (=) followed by the value. Spaces do not matter on either side of the equal sign.

```
Set appRef = CreateObject("Illustrator.Application")
Set docRef = appRef.Documents.Add
```

Object references make life better

Now that you have a way to refer to the `document` object created in the script, it's easy to add the layer. (To modify this script for Photoshop, please note that a layer is called `art layer` in AS; and layers are called `artLayers` in JS or `ArtLayers` in VBS).

AS

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   make layer in myDoc
end tell
```

Even better, we could create another variable to hold the layer. That would allow us to easily refer to the layer if we wanted to define its properties or add an object to the layer.

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc
end tell
```

JS

```
var myDoc = app.documents.add()
   myDoc.layers.add()
```

The same script again, this time creating a variable to hold the layer.

```
var myDoc = app.documents.add()
var myLayer = myDoc.layers.add()
```

VBS

```
   Set appRef = CreateObject("Illustrator.Application")
   Set docRef = appRef.Documents.Add
      docRef.Layers.Add
```

The same script again, this time creating a variable to hold the layer.

```
Set appRef = CreateObject("Photoshop.Application")
   Set docRef = appRef.Documents.Add
   Set layerRef = docRef.Layers.Add
```

Variables provide a nice shortcut

Variables that hold objects also hold the entire containment hierarchy that identifies the object. For example, to refer to `myLayer`, you don't need to refer to the document that contains the layer. The following scripts create a text frame in `myLayer`. Notice that, when you use `myLayer`, you don't need to provide any containment hierarchy information about the layer.

Note: The following script uses the `contents` property to add text to the frame. For now, don't worry about the mechanics of using properties.

The following script uses objects and properties defined in the Illustrator CS3 object model, so it does not work, for example, in InDesign or Photoshop.

AS

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc
   set myTextFrame to make text frame in myLayer
   set contents of myTextFrame to "Hello world!"
end tell
```

JS

```
var myDoc = app.documents.add()
var myLayer = myDoc.layers.add()
var myTextFrame = myLayer.textFrames.add()
   myTextFrame.contents = "Hello world!"
```

VBS

```
Set appRef = CreateObject("Illustrator.Application")
   Set docRef = appRef.Documents.Add
   Set layerRef = docRef.Layers.Add
   Set frameRef = layerRef.TextFrames.Add
      myTextFrame.Contents = "Hello world!"
```

Naming variables

Your scripts will be easier to read if you create descriptive names for your variables. Variable names such as `x` or `c` aren't helpful when you revisit a script. Better names are those that indicate the data the variable contains, such as `theDocument` or `myLayer`.

Giving your variable names a standard prefix helps your variables 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, such as `docRef`, or "layer" to identify variables that contain `Art Layer` objects, such as `layerRef` and `layerRef2`.
- You could use the prefix "my" to add a personal element that separates your variables from script objects. For example, `myDoc` or `myLayer` or `myTextFrame`.

All variable names must conform to the following rules:

- 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. The variable name cannot begin with an underscore character.
- Variable names can contain numbers but cannot begin with a number.
- Variable names cannot contain quotation marks or punctuation other than the underscore character.
- 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.
- Each variable in your script must have a unique name.

Object collections or elements as object references

Scripting languages put each object in a *collection* (JS or VBS) or an *element* (AS), and then assign the object a number, called the *index*, within the element or collection. The objects in an element or collection are identical types of objects. For example, each `channel` object in your document belongs to a `channels` element or collection; each `art layer` object belongs to an `art layers` element or an `artLayers` collection.

In English, you could refer to a document by saying, "Give me the first document in the collection." Scripting languages allow you to identify an object in similar fashion, using its element or collection name and index.

- In AS, you refer to the first document in the `documents` element as `document 1`.
- In JS, the first document is `documents[0]`, (note the square braces surrounding the index) because (and this is hard to remember at first) JavaScript begins numbering collection objects at 0.
- In VBS, the first document is `Documents(0)`, (note the parentheses around the index). VBS begins numbering collection objects at 1.

The following scripts reference the `document` and `layer` objects by index in order to add new objects.

Note: Because the following script does not use variables, entire containment hierarchy is required in each object reference. For example, in the statement that adds a layer, the script must identify the document to which the layer will be added. To add a text frame to the layer, the script must provide the index not only of the layer that will contain the frame, but it must also identify the document that contains the layer.

AS

```
tell application "Adobe InDesign CS3"
   make document
   make layer in document 1
   make text frame in layer 1 of document 1
end tell
```

Note: Beginning scripters using AppleScript are not encouraged to use element numbers as object references when the element contains more than one object. For details as to why, see "How elements and collections number subsequent items" on page 14.

JS

In JavaScript, you indicate an item's index by using the collection name followed by the index in square brackets ([]).

```
app.documents.add()
app.documents[0].layers.add()
app.documents[0].layers[0].textFrames.add()
```

Note: Remember, in JS, index numbers within a collection start at 0.

VBS

In VBScript, you indicate an item's index by using the collection name followed by the index in parentheses.

```
appRef.Documents.Add
appRef.Documents(1).Layers.Add
appRef.Documents(1).Layers(1).TextFrames.Add
```

How elements and collections number subsequent items

Here's how the scripting languages handle the automatic numbering if you add a second object to a collection or element:

- AS assigns number 1 to the new object and renumbers the previously existing object so that it is now number 2. AppleScript object numbers shift among objects to indicate the object that you worked with most recently. This can become confusing in longer scripts. Therefore, beginning scripters are encouraged to use variables as object references and avoid using indexes.
- JS collection numbers are static; they don't shift when you add a new object to the collection. Object numbering in JS indicates the order in which the objects were added to the collection. Because the first object you added was assigned the number 0, the next object you add to the collection is number 1; if you add a third object, it is number 2. For example, when you add a document, the document automatically contains a layer. The layer's index is [0]. If you add a layer, the new layer's index is [1]; if you add a second layer, its index is [2]. If you drag layer [2] to the bottom position in the Layers palette, it still has index [2].
- VBS collection numbers are also static and the numbering performs exactly as described for JS collections, with the exception that the first object in the collection is always (1) in VBS.

Tip: In JS and VBS scripts, you'll find index numbers very useful as object references. 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 index, you'd need to include in your script the names of all of the background layers in all of the files.

Note: Scripts are compulsive organizers. They place objects in elements or collections even when there is only one object of that type in the entire collection.

Note: Objects can belong to more than one collection or element. For example, in Photoshop, `art layer` objects belong to the `art layers` element or collection, and `layer set` objects belong to the `layer sets` element or collection, but both `art layer` objects and `layer set` objects belong to the `layers` element or collection. Similarly, in InDesign, `rectangle` objects belong to the `rectangles` element or collection and `text frame` objects belong to the `text frames` element or collection. However, both `rectangle` objects and `text frame` objects also belong to the `page items` element or collection, which contains all sorts of items on a page such as ellipses, graphic lines, polygons, buttons, and other items.

Referring to the current or active object

When you ran your first script and created a new document, the application opened, and then it created a document. If you wanted to modify that document in the application's user interface, you could have just gone to work with your mouse, menus, toolbox, and palettes, because the document was automatically selected.

This is true for all objects you create in a script. Until the script does something else, the new object is the active object, ready for modifications.

Conveniently, many parent objects contain properties that allow you to refer easily to the active object. (You'll learn about properties in detail a little later in this guide. For now, you can just copy the script statements in this section and watch how they work without understanding completely why they look the way they do.)

- In AS, the property that refers to an active object consists of the word `current` and the object name. Some examples are:

```
current document
current layer
current channel
current view
```

- In JS, the property name is a compound word that combines `active` with the object name, in standard JS case usage:
  - The first word in the combined term is lower case.
  - The second word (and all subsequent words) in the combined term use initial caps.

  Some examples are:

```
activeDocument
activeLayer
activeChannel
activeView
```

- VBS is exactly the same as JS, except that all words in the combined term use initial caps. Some examples are:

```
ActiveDocument
ActiveLayer
ActiveChannel
ActiveView
```

The following scripts create a document and then use this principle to create a layer in the new document.

AS

```
tell application "Adobe Illustrator CS3"
   make document
   make layer in current document
end tell
```

JS

```
app.documents.add()
app.activeDocument.layers.add()
```

Note: Be sure to type `activeDocument` without an `s` at the end.

VBS

```
Set appRef = CreateObject("Illustrator.Application")
docRef.Documents.Add
appRef.ActiveDocument.Layers.Add
```

Note: Be sure to type `ActiveDocument` without an `s` at the end.

Using properties

To define or modify a property of an object, you do three things:

1. Name the object.
2. Name the property.
3. Specify the value for the property.

The value can be any of the following datatypes:

- A string, which is alphanumeric text that is interpreted as text. You enclose strings in quotes (""). Strings include such values as an object's name.
- Numeric, which is a number value that can be used in mathematical operations like addition or division. Mathematical numbers include the length of one side of a frame or the space between paragraphs, the opacity percentage, font size, stroke weight, and so on.

  Note that some values that look like numbers are really strings. For example, a phone number or social security number are numbers, but you would format them as strings (enclose them in quotes) because the data would not be considered mathematical numbers.

  Within the numeric category, there are different types of numbers:

  - Integer, which is a whole number without any decimal points
  - Real, fixed, short, long, or double, which are numbers that can include decimal digits, such as 5.9 or 1.0.

  Note: These differences may not seem important now, but keep them in mind for later.
- A variable. When you use a variable as a property value, you do not enclose the variable in quotes as you would a string.

- A Boolean value, which is either `true` or `false`.

Note: In many cases, Boolean values act as an on/off switch.

- A constant value (also called an *enumeration*), which is a pre-defined set of values from which you can choose. Using constant values for a property is conceptually similar to using a drop-down menu in an Adobe application. Constants, and how and when to use them, are explained in "Constant values and enumerations" on page 20.
- A list (AS) or an array (JS and VBS).

  Some properties require multiple values, such as the page coordinates of a point location (x and y coordinates), or the boundaries of a text frame or geometric object. Multiple values for a single property are called a list in AS and an array in JS or VBS. Each language specifies formatting rules.

  - The list or array must be enclosed as follows:
    - In AS, the list is enclosed in curly braces: `{ }`
    - In JS the array is enclosed in square brackets: `[]`
    - In VBS, the array is enclosed in parentheses and follows the keyword `Array`: `Array()`
  - Values are separated by a comma (`,`). You can include or omit spaces after the commas; it doesn't matter.
    - AS: `{3,4,5}` or `{"string1", "string2", "string3"}`
    - JS: `[3,4,5]` or `["string1", "string2", "string3"]`
    - VBS: `Array(3,4,5)` or `Array("string1", "string2", "string3")`
  - A list or array can included nested lists or arrays, such as a list of page coordinates. In the following samples, notice that each nested array is enclosed individually, and that the nested arrays are separated by commas.
    - AS: `{{x1, y1}, {x2, y2}, {x3, y3}}`
    - JS: `[[x1, y1], [x2, y2], [x3, y3]]`
    - VBS: `Array(Array(x1, y1), Array(x2, y2), Array(x3, y3))`

AS

To use properties in AS, you use the `set` command followed by the property name, and then type `of` followed by the object reference. The following script defines the `name` property of the `layer` object

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc
   set name of myLayer to "My New Layer"
end tell
```

You can set several properties in a single statement using the `properties` property. You format the multiple properties as an array, enclosed in curly braces. Within the array, separate each property name/property value pair with a colon (`:`). The following script uses `properties` to define the layer's name and visibility state.

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc
   set properties of myLayer to {name:"My New Layer", visible:false}
end tell
```

Note: Notice in the preceding script that only the string value `"My New Layer"` is enclosed in quotes. The value for the `visible` property, `false`, may look like a string, but it is a Boolean value. To review value types, see "Using properties" on page 16.

You can define an object's properties in the statement that creates the object, as in the following scripts.

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc with properties {name:"My New Layer"}
end tell


tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc with properties {name:"My New Layer",
      visible:false}
end tell
```

JS

To use a property in JS, you name the object that you want the property to define or modify, insert a period (.), and then name the property. To specify the value, place an equal sign (=) after the property name, and then type the value.

```
var myDoc = app.documents.add()
var myLayer = myDoc.layers.add()
   myLayer.name = "My New Layer"
```

To define multiple properties, you can write multiple statements:

```
var myDoc = app.documents.add()
var myLayer = myDoc.layers.add()
   myLayer.name = "My New Layer"
   myLayer.visible = false
```

Note: Notice in the preceding script that only the string value `"My New Layer"` is enclosed in quotes. The value for the `visible` property, `false`, may look like a string, but it is a Boolean value. To review value types, see "Using properties" on page 16.

JS provides a shorthand for defining multiple properties, called a `with` statement. To use a `with` statement, you use the word `with` followed by the object whose properties you want to define, enclosing the object reference in parentheses (`()`). Do not type a space between `with` and the first parenthesis. Next, you type an opening curly brace ({), and then press **Enter** and type a property name and value on the following line. To close the `with` statement, you type a closing curly brace (}).

```
var myDoc = app.documents.add()
var myLayer = myDoc.layers.add()
with(myLayer){
   name = "My New Layer"
   visible = false
   }
```

Using a `with` statement saves you the trouble of typing the object reference followed by a period (in this case, `myLayer.`) for each property. When using a `with` statement, always remember the closing curly bracket.

JS also provides a `properties` property, which allows you to define several values in one statement. You enclose the entire group of values in curly braces ({ }). Within the braces, you use a colon (`:`) to separate a property name from its value, and separate property name/property value pairs using a comma (`,`).

```
var myDoc = app.documents.add()
var myLayer = myDoc.layers.add()
   myLayer.properties = {name:"My New Layer", visible:false}
```

VBS

To use properties in VBS, you name the object, insert a period (.), and then name the property. To specify the value, place an equal sign (=) after the property name, and then type the value.

```
Set appRef = CreateObject("Illustrator.Application")
Set myDoc = appRef.Documents.Add
Set myLayer = myDoc.Layers.Add
   myLayer.Name = "My First Layer"
```

You can define only one property per statement. To define multiple properties, you must write multiple statements:

```
Set appRef = CreateObject("Illustrator.Application")
Set myDoc = appRef.Documents.Add
Set myLayer = myDoc.Layers.Add
   myLayer.Name = "My First Layer"
   myLayer.Opacity = 65
   myLayer.Visible = false
```

Note: Notice in the preceding script that only the string value `"My New Layer"` is enclosed in quotes. The value for the `Visible` property, `false`, may look like a string, but it is a Boolean value. To review value types, see "Using properties" on page 16.

Understanding read-only and read-write properties

When defining property values, you can write a script statement with perfect syntax, but the statement does not produce any results. This can happen when you try to define a property that is not "writeable"; the property is *read-only*.

For example, the `name` property of the document object in most Adobe applications is read-only; therefore, you cannot use a script to define or change the name of an existing document (although you can use a `save as` command or method; see "Using methods or commands" on page 23 for information). So why bother to have a property that you can't set, you might ask. The answer is that read-only properties are valuable sources of information. For example, you may want to find out what a document's name is, or how many documents are in the `Documents` collection.

Using alert boxes to show a property's value

A good way to display information in a read-only property is to use the alert box, which is a small dialog that simply displays information. You can use alert boxes to display the value of any property: read-write or read-only.

AS

To display an alert box in AS, you type `display dialog`, and then type the dialog content in parentheses (`()`). To find out how many objects are in an element, use the `count` command with any element name.

Note: The element name is the plural form of the object. For example, the `document` object's element is the `documents` object.

The following script displays an alert box that tells you how many documents are in the `documents` element, then adds a document and displays a new alert with the updated number.

```
tell application "Adobe Photoshop CS3"
   display dialog (count documents)
   set myDoc to make document
   display dialog (count documents)
end tell
```

To get a string value to display in an alert box, you must store the string value in a variable. The following script converts the document name to a variable named `myName`, and then displays the value of `myName`.

```
tell application "Adobe Photoshop CS3"
   set myDoc to make document
   set myName to name of myDoc
   display dialog myName
end tell
```

JS

To display an alert box in JS, you use the `alert()` method by typing `alert`, and then typing the dialog content in parentheses (`()`). Do not type a space between `alert` and the first parenthesis. To find out how many objects are in a collection, use the (read-only) `length` property of any collection object. The following script displays an alert box that tells you how many documents are in the `documents` collection, then adds a document and displays a new alert with the updated number.

Note: The collection object name is the plural form of the object. For example, the `document` object's collection object is the `documents` object.

```
alert(app.documents.length)
var myDoc = app.documents.add()
alert(app.documents.length)
```

The following script displays the document's name in an alert box.

```
var myDoc = app.documents.add()
alert(myDoc.name)
```

VBS

To display an alert box in VBS, you use the `MsgBox` method by typing `MsgBox`, and then typing the dialog content in parentheses (`()`). Do not type a space between `MsgBox` and the first parenthesis. To find out how many objects are in a collection, use the (read-only) `Count` property of any collection object. The following script displays an alert box that tells you how many documents are in the `Documents` collection, then adds a document and displays a new alert with the updated number.

Note: The collection object is the plural form of the object. For example, the `Document` object's collection object is the `Documents` object.

```
Set appRef = CreateObject("Photoshop.Application")
MsgBox(appRef.Documents.Count)
Set myDoc = appRef.Documents.Add
MsgBox(appRef.Documents.Count)
```

The following script displays the document's name in an alert box.

```
Set appRef = CreateObject("Photoshop.Application")
Set myDoc = appRef.Documents.Add
MsgBox(myDoc.Name)
```

Constant values and enumerations

Some properties' values are pre-defined by the application. For example, in most applications, the page orientation can be either landscape or portrait. The application accepts only one of these two values; it will not accept "vertical" or "upright" or "horizontal" or "on its side". To make sure your script provides an acceptable value for a document's page orientation property, the property has been written so that it can accept only a pre-defined value.

In scripting, these pre-defined values are called *constants* or *enumerations*.

Using a constant or an enumeration is similar to using a drop-down list in the application's user interface.

Note: To find whether you must use an enumeration for a property's value, look up the property in one of the scripting references provided by Adobe. For information, see Chapter 3, "Finding an object's properties and methods" on page 31.

AS

In AS, you use constants as you would any other property definition. Do not enclose the constant in quotes. The following script uses the constant value `dark green` to set the layer color of a new layer.

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc
   set layer color of myLayer to dark green
end tell
```

Note: If `dark green` were a string value rather than an constant, the value would be enclosed in quotes:

```
set layer color of myLayer to "dark green"
```

JS

In JS, you type the enumeration name, a period (.), and then the enumeration value. You must use the exact spelling and capitalization as defined in the scripting references provided by Adobe. Formatting is different in different Adobe applications. For example:

- In InDesign:
  - Each enumeration begins with an upper case letter, and all words within the combined term also begin with an upper case letter.
  - The enumeration value begins with a lower case letter.

    The following example uses the `UIColor` enumeration to set the layer color to dark green.

    ```
    var myDoc = app.documents.add()
    var myLayer = mydoc.layers.add()
       myLayer.layerColor = UIColor.darkGreen
    ```
- In Illustrator:
  - Each enumeration begins with an upper case letter, and all words within the combined term also begin with an upper case letter.
  - Some enumeration values begin with an upper case letter and then use lower case letters. Others use all upper case. You must be sure to use the value exactly as it appears in the scripting reference.

    The following example uses the `RulerUnits` enumeration to set the default unit to centimeters.

    ```
    var myDoc = app.documents.add()
       myDoc.rulerUnits = RulerUnits.Centimeters
    ```

    The next script uses the `BlendModes` enumeration, whose values are expressed in all upper case letters.

    ```
    var myDoc = app.documents.add()
    var myLayer = myDoc.layers.add()
       myLayer.blendingMode = BlendModes.COLORBURN
    ```
- In Photoshop:
  - Each enumeration begins with an upper case letter, and all words within the combined term also begin with an upper case letter.

- Enumeration values are all upper case.

  The following example uses the `LayerKind` enumeration to make the layer a text layer.

```
var myDoc = app.documents.add()
var myLayer = mydoc.artLayers.add()
   myLayer.kind = LayerKind.TEXT
```

VBS

In VBS, you use numeric values for constants.

```
Set appRef = CreateObject("Photoshop.Application")
Set docRef = appRef.Documents.Add
Set layerRef = docRef.ArtLayers.Add
   layerRef.Kind = 2
```

Using variables for property values

You can use variables to contain property values. This can help you update a script quickly and accurately. For example, you may have a publication in which all photos are 3 x 5 inches. If you use a variable to set the photo height and the photo width, and then the measurements change, you only have to change the values in one variable, rather than the measurements for each photo in the document.

The following script creates variables to contain the values of the document's width and height, and then uses the variables as values in the statement that changes the width and height.

AS

```
tell application "Adobe Illustrator CS3"
   set myDoc to make document with properties {height:10, width:7}
   set docHeight to height of myDoc
   set docWidth to width of myDoc
   set myDoc with properties {height:docHeight - 2, width:docWidth - 2}
end tell
```

JS

```
var myDoc = app.documents.add(7, 10)
var docHeight = myDoc.height
var docWidth = myDoc.width
   myDoc.resizeCanvas((docHeight - 2), (docWidth - 2))
```

VBS

```
   Set appRef = CreateObject("Photoshop.Application")
   Set myDoc = appRef.Documents.Add(7, 10)
   docHeight = myDoc.Height
   docWidth = myDoc.Width
   myDoc.ResizeCanvas docWidth - 2, docHeight - 2
```

Note: The `MsgBox` method does not work when you open a script from the Scripts menu in some Adobe applications. To properly display the message box, double-click the script file in Windows Explorer® .

Using methods or commands

Commands (in AS) and methods (in VBS and JS) are directions you add to a script to perform tasks or obtain results. For example, you could use the `print`/`print()`/`PrintOut` command/method to print a document.

AS

AS commands appear at the beginning of a script statement as an imperative verb. The command is followed by a reference to the object upon which you want the command to act.

The following script prints the active document:

```
tell application "Adobe InDesign CS3"
   print current document
end tell
```

JS

You insert methods at the end of JS statements. You must place a period before the method name, and then follow the method name with parentheses (`()`).

```
app.activeDocument.print()
```

VBS

You insert methods at the end of VBS statements. You must place a period before the method name.

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

Command or method parameters

Some commands or methods require additional data, called *arguments or parameters*. Commands or methods can also have optional parameters.

Required parameters

The following scripts use the `merge` command, which requires some indication of the layers you want to merge into the selected layer. Just like properties, command parameters are enclosed in curly braces ({ }). However, you include only the parameter value, and not the parameter name, within the braces.

Note: This script is for InDesign. There is no merge operation in Illustrator. To modify this script for Photoshop, please note that a layer is called `art layer` in AS; and layers are called `artLayers` in JS or `ArtLayers` in VBS.

AS

```
tell application "Adobe InDesign CS3"
   set myDoc to make document

   set myLayer to make layer in myDoc
   set myLayer2 to make layer in myDoc

   merge myLayer2 with {myLayer}
end tell
```

JS

The method parameter is enclosed in the parentheses that follow the method name.

```
var myDoc = app.documents.add()

var myLayer = myDoc.layers.add()
var myLayer2 = myDoc.layers.add()

myLayer2.merge(myLayer)
```

VBS

Notice that the method parameter is enclosed in parentheses after the method name. Do not type a space before the first parenthesis.

```
Set appRef = CreateObject("InDesign.Application")
Set myDoc = appRef.Documents.Add

Set myLayer = myDoc.Layers.Add
Set myLayer2 = myDoc.Layers.Add

myLayer2.Merge(myLayer)
```

Multiple parameters

When you define more than one parameter for a command or method, you must follow specific rules.

AS

There are two types of parameters for AS commands:

- A *direct* parameter, which defines the direct object of the action performed by the command
- *Labeled* parameters, which are any parameters other than direct parameters

The direct parameter must follow the command directly. In the following statement, the command is `make` and the direct parameter is `document`.

```
make document
```

You can insert labeled parameters in any order. The following script creates two layers, and defines the location and name of each layer. Notice that, in the statements that create the layers, the `location` and `name` parameters appear in different orders.

```
tell application "Adobe InDesign CS3"
   set myDoc to make document
   tell myDoc
      set myLayer to make layer at beginning of myDoc with properties {name:"Lay1"}
      set myLayer2 to make layer with properties {name:"Lay2"} at end of myDoc
   end tell
end tell
```

JS

In JS, you must enter parameter values in the order they are listed in the scripting reference resources so that the script compiler knows which value defines which parameter.

Note: For information on scripting reference resources, see Chapter 3, "Finding an object's properties and methods" on page 31.

To skip an optional parameter, type the placeholder `undefined`. The following statement creates a Photoshop CS3 document whose width is 4000 pixels, height is 5000 pixels, resolution is 72, name is "My Document", and document mode is bitmap.

```
app.documents.add(4000, 5000, 72, "My Document", NewDocumentMode.BITMAP)
```

The next statement creates an identical document except that the resolution is left undefined.

```
app.documents.add(4000, 5000, undefined, "My Document", NewDocumentMode.BITMAP)
```

Note: Use the `undefined` placeholder only to "reach" the parameters you want to define. The following statement defines only the document's height and width; placeholders are not needed for subsequent optional parameters.

```
app.documents.add(4000, 5000)
```

VBS

In VBS, you must enter parameter values in the order they are listed so that the script compiler knows which value defines which parameter.

To skip an optional parameter, type the placeholder `undefined`. The following statement creates a Photoshop CS3 document whose width is 4000 pixels, height is 5000 pixels, resolution is 72, name is "My Document", and document mode is bitmap.

```
Set appRef = CreateObject("Photoshop.Application")
Set myDoc = appRef.Documents.Add(4000, 5000, 72, "My Document", 5)
```

The next statement creates an identical document except the resolution is left undefined.

```
Set appRef = CreateObject("Photoshop.Application")
Set myDoc = appRef.Documents.Add(400, 500, undefined, "My Document", 5)
```

Note: Use the `undefined` placeholder only to "reach" the parameters you want to define. The following statement defines only the document's height and width; placeholders are not needed for subsequent optional parameters.

```
Set appRef = CreateObject("Photoshop.Application")
Set myDoc = appRef.Documents.Add(4000, 5000)
```

The `undefined` placeholder is not case-sensitive.

Tell statements (AS only)

You may have noticed that AppleScript examples start and end with the statements:

```
tell application "Application Name"
end tell
```

A `tell` statement names the default object that performs all commands contained within the statement. In the preceding sample, the `tell` statement targets the application object. Therefore, any commands contained within the statement must be performed by the application object unless another object is explicitly named in a script statement within the `tell` statement.

The following script carefully outlines the full containment hierarchy of each object to indicate which object the command must work upon:

```
tell application "Adobe InDesign CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc
   set myLayer2 to make layer in myDoc
end tell
```

You can create a shortcut by changing the command target. To do so, you add a nested `tell` statement. The following script performs the exact same operation as the previous script. Because the nested `tell` statement targets the document object, it is not necessary to refer to the document object in the statements that create the layers.

```
tell application "Adobe InDesign CS3"
   set myDoc to make document
   tell myDoc
      set myLayer to make layer
      set myLayer2 to make layer
   end tell
end tell
```

Notice that each `tell` statement must be closed with its own `end tell` statement.

You can nest as many `tell` statements as you wish.

Notes about variables

This section provides additional information about using variables.

Changing a variable's value

You can change a variable's value at any time. To do so, you simply use the variable name followed by the assignment operator (`to` in AS; = in JS or VBS) and the new value. The following scripts create the variable `layerRef` to contain a new layer, and then immediately create a second layer and assign it as `layerRef`'s new value.

AS

To change a variable's value in AS, you use the `set` command.

```
tell application "Adobe Illustrator CS3"
   set docRef to make document
   set layerRef to make layer in myDoc with properties {name:"First Layer"}
   set layerRef to make layer in myDoc with properties {name:"Second Layer"}
end tell
```

JS

To change a variable's value in JS, you use the variable name followed an equal sign (=) and the new value. Do not begin the reassignment statement with `var`; you use `var` only when creating a new variable.

```
var docRef = app.documents.add()
var layerRef = myDoc.layers.add()
   layerRef.name = "First Layer"
   layerRef = myDoc.layers.add()
   layerRef.name = "Second Layer"
```

VBS

To change a variable's value in VBS, you use the `Set` command.

```
Set appRef = CreateObject("Illustrator.Application")
Set docRef = appRef.Documents.Add
Set layerRef = docRef.Layers.Add
   layerRef.Name = "First Layer"
   layerRef = docRef.Layers.Add
   layerRef.Name = "Second Layer"
```

Using variables to refer to existing objects

You can also create variables to contain existing objects.

AS

```
tell application "Adobe Photoshop CS3"
   set myDoc to current document
end tell
```

JS

```
var myDoc = app.activeDocument
```

VBS

```
Set appRef = CreateObject("Illustrator.Application")
Set docRef = appRef.ActiveDocument
```

Making script files readable

This section covers two options that help make your script files more readable:

- Comments
- Line breaks

Commenting the script

A script comment is text that the scripting engine ignores when it executes your script.

Comments are very useful when you want to document the operation or purpose of a script (for yourself or for someone else). Most programmers, even the most advanced, take the time to insert comments for almost every element in a script. Comments may not seem important to you when you are writing your scripts, but you will be glad you included comments a month or a year later when you open a script and wonder what you were trying to do and why.

AS

To comment all or part of a single line in an AS, type two hyphens (`--`) at the beginning of the comment. To comment multiple lines, surround the comment with `(*` and `*)`.

```
tell application "Adobe InDesign CS3"
   --This is a single-line comment
   print current document --this is a partial-line comment
   --the hyphens hide everything to their right from the scripting engine
   (* This is a multi-line
      comment, which is completely
      ignored by the scripting engine, no matter how
      many lines it contains.
      The trick is to remember to close the comment.
      If you don't the rest of your script is
      hidden from the scripting engine!*)
end tell
```

Note: The only thing this script does is print the current document.

JS

To comment all or part of a single line in JS, type two forward slashes (`//`) at the beginning of the comment. To comment multiple lines, surround the comment with `/*` and `*/`.

```
//This is a single-line comment
app.activeDocument.print() //this part of the line is also a comment

/* This is a multi-line
   comment, which is completely
   ignored by the scripting engine, no matter how
   many lines it contains.
   Don't forget the closing asterisk and slash
   or the rest of your script will be commented out...*/
```

Note: The only thing this script does is print the active document.

VBS

In VBS, type `Rem` (for "remark") or `'` (a single straight quote) at the beginning of the comment. VBS does not support comments that span more than one line. To comment several lines in a row, start each line with either comment format.

```
'This is a comment.
Set appRef = CreateObject("Photoshop.Application")
Rem This is also a comment.
appRef.ActiveDocument.PrintOut 'This part of the line is a comment.
' This is a multi-line
' comment that requires
' a comment marker at the beginning
' of each line.
Rem This is also a multi-line comment. Generally, multi-line
Rem comments in VBS are easier for you to identify (and read) in your scripts
Rem if they begin with a single straight quote (') rather than if they begin
Rem with Rem, because Rem can look like any other text in the script
' The choice is yours but isn't this more easily
' identifiable as a comment than the preceding
' four lines were?
```

Note: The only thing this script does is print the active document.

Continuing long lines in AppleScript and VBScript

In both AppleScript and VBScript, a carriage return at the end of a line signals the end of a statement. When your script lines are too long to fit on one line, you can use special *continuation* characters—characters that break a line but direct the script to read the broken line as a legitimate instruction.

Note: You can also expand the scripting editor window to continue the statement on a single line.

AS

Type the character ¬ (**Option+Return**) to break a long line but continue the statement.

```
tell application "Adobe InDesign CS3"
   set myDoc to make document
   set myLayer to make layer in myDoc with properties {name:"My First Layer"} at the¬
      beginning of myDoc (* without the line break character, AS would consider this
          line an incomplete statement*)
   (* note that line continuation characters are not required in a multi-line comment
   such as this one*)
   set myLayer2 to make layer in myDoc with properties {name:"My Other Layer"} ¬
      before myLayer
end tell
```

VBS

Type an underscore (_) followed by a carriage return to break a long line but continue the statement.

Note: In both languages, the continuation character loses its functionality if it is placed inside a string (that is, within the quotes). If the line break occurs within a string value, place the break character before the string and insert the line break early.

Note: In JavaScript, statements can contain carriage returns, so there is no need for a continuation character. However, the ExtendScript interpreter interprets each line as a complete statement. In general, therefore, it's best to insert returns only at the ends of statements.

Using Arrays

In VBScript and JavaScript, arrays are similar to collections; however, unlike collections, 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)
```

Note: While indexes in VBS collections always begin numbering at (1), you can stipulate in your VBS scripts whether arrays that you create begin numbering at (1) or (0). To find out how to set the array index starting number, refer to any VBScript text book. For information on collections and index numbers, see "Object collections or elements as object references" on page 13.

Creating objects

Your first script demonstrated how to create an object using the `make` command (AS), `add()` method (JS), or `Add` method (VBS) of the object's collection object. For example:

AS

```
tell application "Adobe Photoshop CS3"
   make document
end tell
```

JS

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

VBS

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

However, some objects do not have a `make` command (AS), `add()` method (JS), or `Add` method (VBS). To create objects of these types, refer to the section "Creating new objects" in the chapter for your scripting language in the Adobe scripting guide for your application.

More information about scripting

At this point you have enough knowledge to create simple scripts that perform basic tasks. To further your scripting skills, use any of the following resources:

- "Advanced scripting techniques" on page 43.
- The Adobe scripting guide for your application.
- "Bibliography" on page 50.

3 Finding an object's properties and methods

Adobe provides the following resources to help you find and use the objects, methods or commands, properties, enumerations, and parameters you need to create effective scripts.

- Object dictionaries or type libraries. Each scriptable Adobe application provides a reference library or dictionary within your script editor environment.
- The Adobe scripting reference documents (in PDF format), which are located on your installation CD. (Scripting reference documents are not provided for all Adobe applications.)

Using scripting environment browsers

This section explains how to display and use the scripting environment object browsers for each scripting language.

AppleScript data dictionaries

The AppleScript dictionaries are available through Apple's Script Editor application.

Displaying the AppleScript dictionaries

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

1. In Script Editor, choose File > Open Dictionary. Script Editor displays an Open Dictionary dialog.
2. Choose your Adobe application, and then choose Open. Script Editor opens the Adobe application and then displays the application's dictionary.

Using the AppleScript dictionaries

The AS dictionary divides objects into suites. Suite names are indicative of the type of objects that the suite contains.

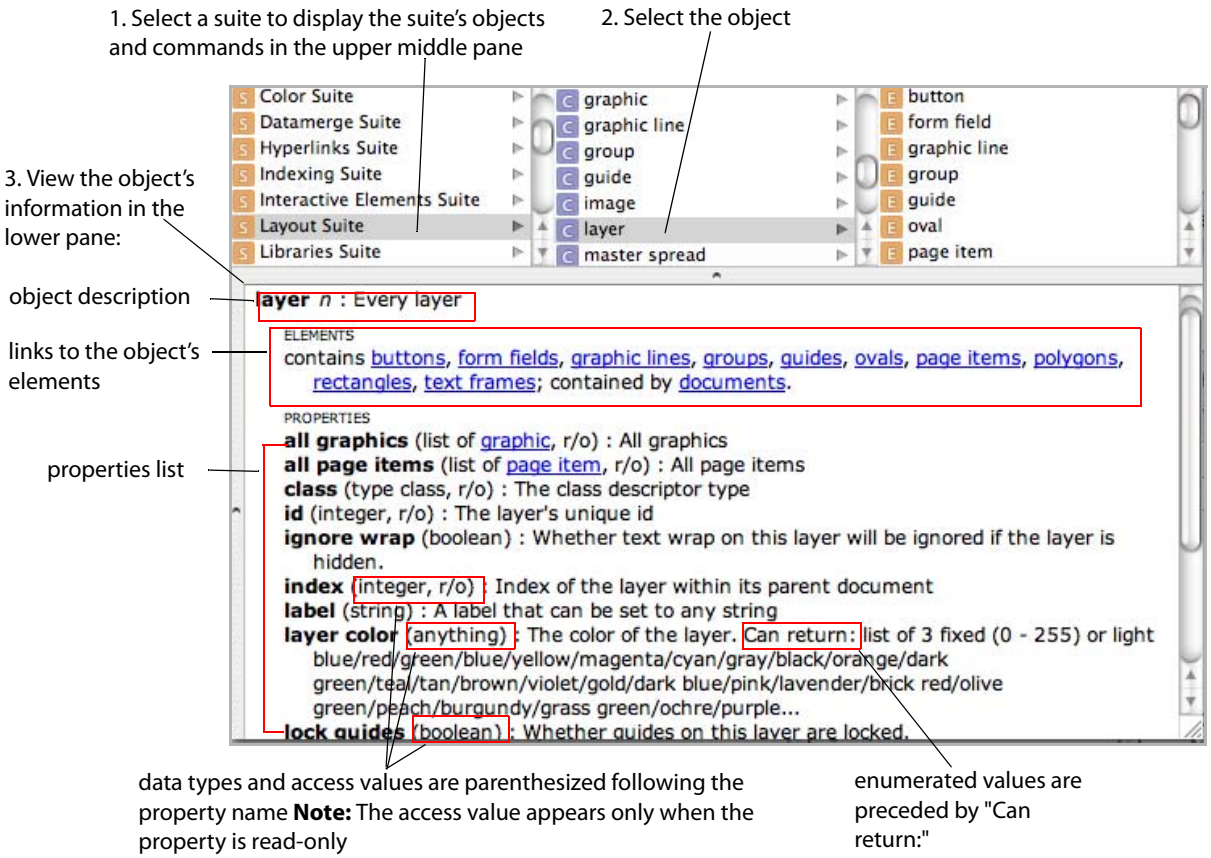
➤ **To view an object's properties:**

1. In the upper left pane of the data dictionary screen, select the suite that contains the object.
2. Select the object in the upper middle pane.

   Note: Objects are indicated by a square icon:  ; commands are indicated by a round icon:  .

   The object description appears in the lower viewing pane. The object's elements and properties are listed below the description. Each element name is a hyperlink to the element's object type.

3. Each property listing contains the following:
   - The property name
   - The data type in parentheses
     - If the data type is an object, the data type is a hyperlink to the object.
     - If the data type is an enumeration, the data type is "anything". The valid values are listed after the property description and separated by forward slashes (/), and are preceded by the notation "Can return:".
   - The access value:
     - If the object is read-only, `r/o` appears after the data type.
     - If the object is read-write, no access value is given.
   - A description of the property.



Viewing commands and command parameters

Note: The data dictionary lists the objects you can use with a command. However, it does not list the commands you can use with an object. To view a list of commands you can use with an object, refer to the AppleScript scripting reference for your application. See "Using Adobe scripting reference documents" on page 39 for more information.

➤ **To view commands in the data dictionary:**

1. In the upper left pane of the data dictionary screen, select the suite that contains the command.

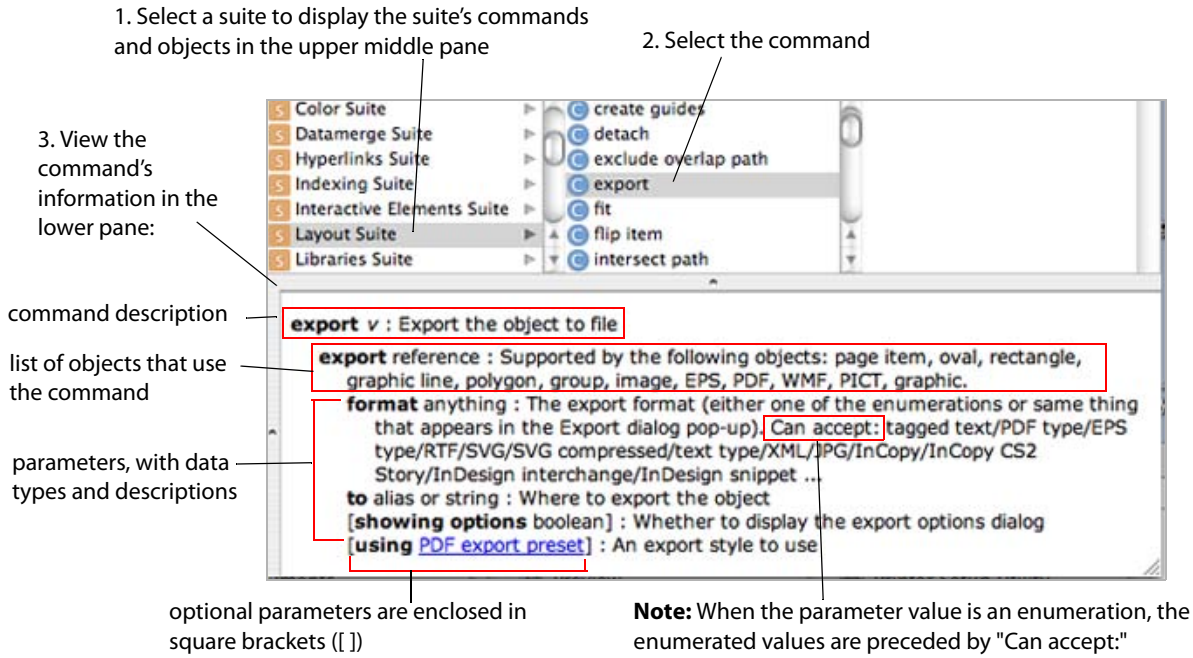
   The upper middle pane lists the commands and objects contained in the suite.

2. Select the command in the upper middle pane.

   Note: Commands are indicated by a round icon: ; objects are indicated by a square icon: .

   The command description appears in the lower viewing pane.

   - Below the description, the objects with which you can use the command are listed.
   - Below the list of supported objects, the parameters are listed.
     - If the parameter is optional, it is enclosed in square brackets ([ ]).
     - If no brackets appear around the parameter name, the parameter is required.
   - Each parameter name is followed by the data type.
     - If the data type is an object, the data type is a hyperlink to the object.
     - If the data type is an enumeration, the valid values are preceded by the notation "Can accept:" and then listed, separated by forward slashes (/).



JavaScript object model viewer

You can use the ExtendScript Tools Kit (ESTK), which is installed with your Adobe applications, to display the JavaScript objects and methods available for your Adobe application.

For information on displaying and using the JavaScript object model viewer for your Adobe application, see the *JavaScript Tools Guide*.

VBScript type libraries

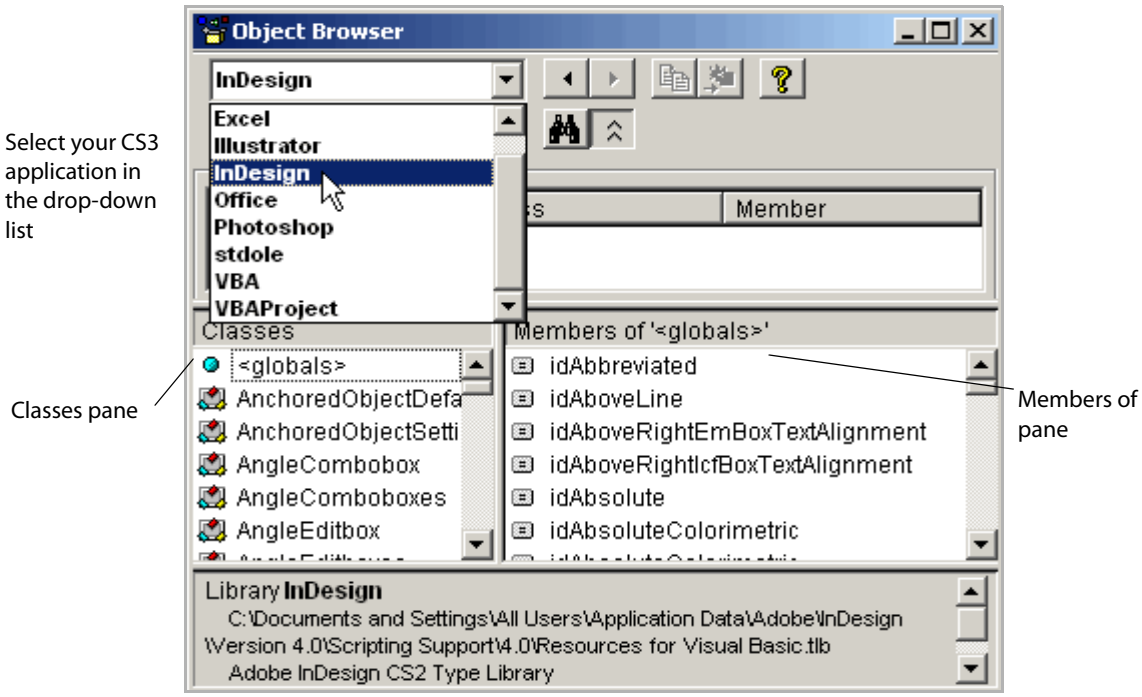
You can use the Visual Basic editor in any Microsoft Office application to display the VBScript objects and methods available for your Adobe application.

Note: If you use a different editor, refer to the editor's help system to find out how to display type libraries.

Displaying the VBScript type libraries

➤ **To view the VBS object library:**

1. Start any Microsoft Office application, and then choose Tools > Macro > Visual Basic Editor.
2. In the Visual Basic editor window, choose Tools > References.
3. In the References dialog's Available References list, select your Creative Suite application, and then click OK.
4. In the Visual Basic editor window, choose View > Object Browser.
5. Select your Adobe application in the drop-down list in the upper left corner of the Object Browser window.



Using the VBScript type libraries

The VBS object type library displays objects and constants in the Classes pane on the left side of of the Object Browser window. In the Classes pane:

- Objects are indicated by the following icon:
- Constants are indicated by the following icon:

To display an object's properties and method, you select the object type in the Classes pane. The properties and methods are listed in the Members of pane to the right of the Classes pane.

- Properties are indicated by the following icon:
- Methods are indicated by the following icon:

Understanding property listings in the Object Browser

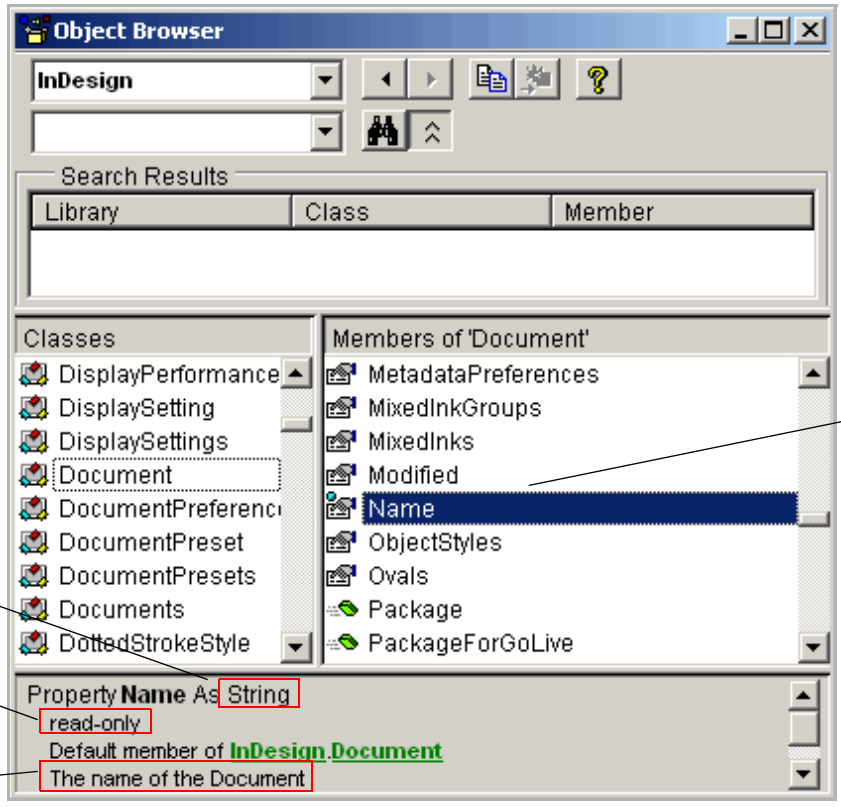
When you select a property in the Members of pane, the property's information is displayed in the information pane at the bottom of the Object Browser window as follows:

- The property name is followed by the data type.
  - If the data type is a constant, the constant appears as a hyperlink to the constant's values. Constant names begin with a prefix that matches the Adobe application's abbreviated name. For example:
    - The prefix `Ps` is used for enumerations in Photoshop CS3.

      Examples: `PsColorProfileType`, `PsBitsPerChannelType`
    - The prefix `id` is used for enumerations in InDesign CS3.

      Examples: `idRenderingIntent`, `idPageOrientation`
    - The prefix `Ai` is used for enumerations in Illustrator CS3. (Ai = *A*dobe *I*llustrator)

      Examples: `AiCropOptions`, `AiBlendModes`
  - If the data type is an object, the object name is a hyperlink to the object type.
- The access value appears only if the property is read-only. If the property is read-write, no access value appears.



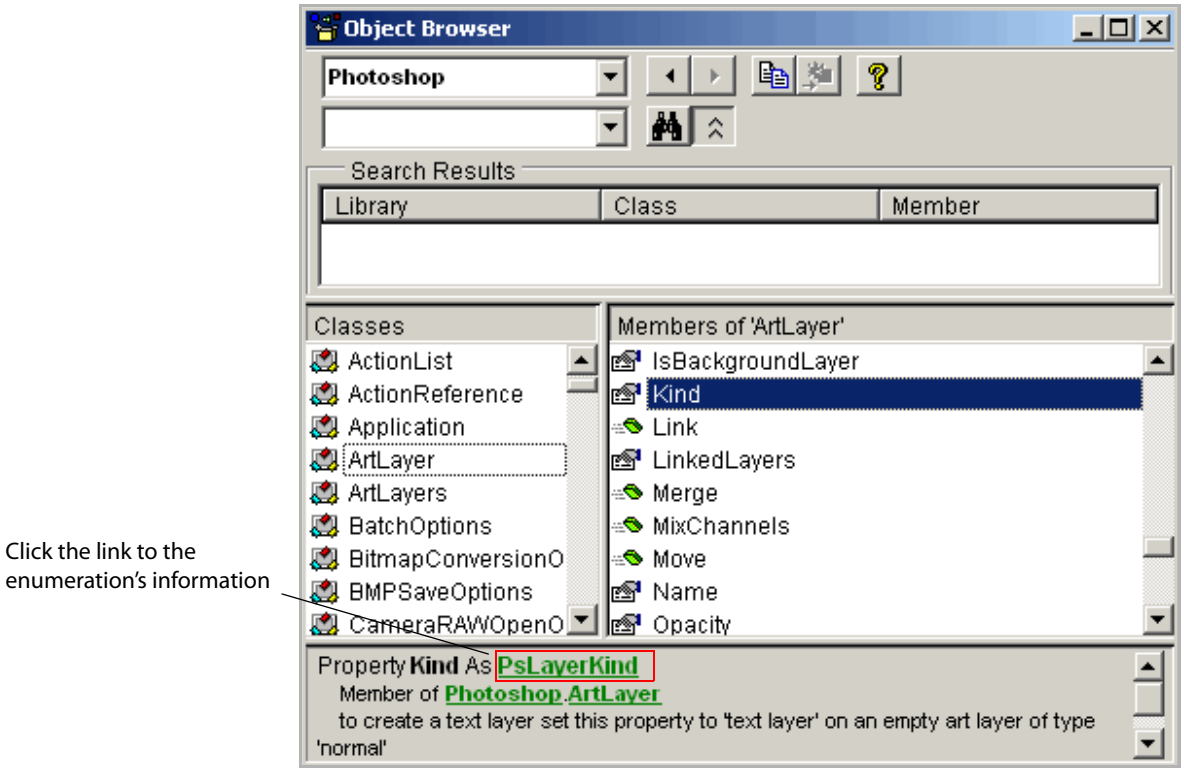
Finding an enumeration's numeric value

In VBS, you use an enumeration's numeric value as a property value. For example, in the following script, the layer type, represented by the `Kind` property in the last line of the script, is defined by the numeric value `2`, which represents the `TextLayer` constant value.

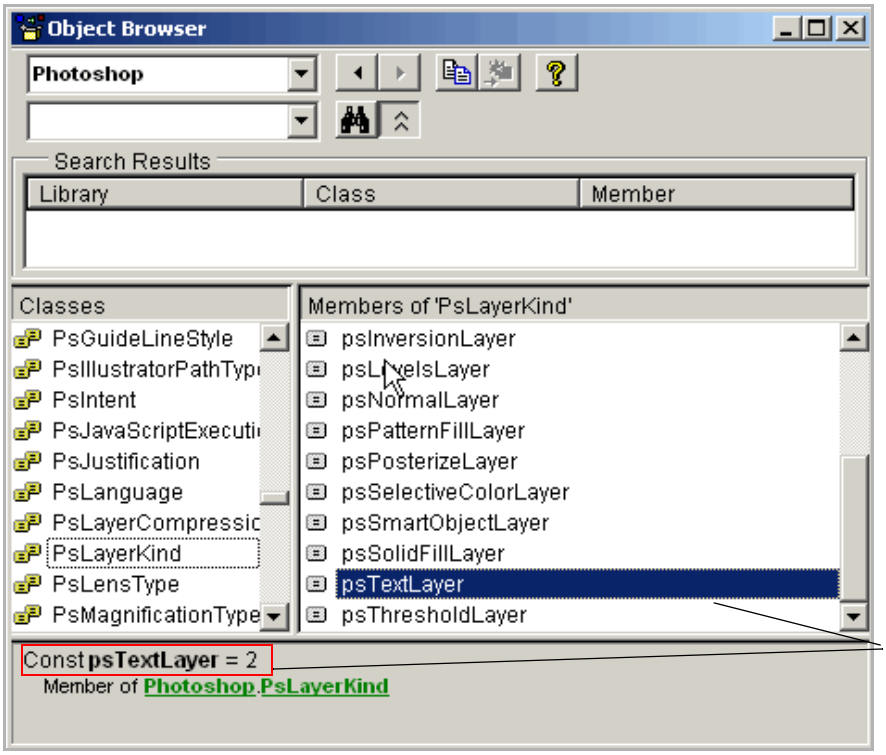
```
Set appRef = CreateObject("Photoshop.Application")
Set docRef = appRef.Documents.Add
Set layerRef = docRef.ArtLayers.Add
   layerRef.Kind = 2 'PsTextLayer
```

➤ **To find an enumeration's numeric value:**

1. Click the link to the enumeration's information.



2. Click the enumeration value to display the numeric value in the bottom pane.

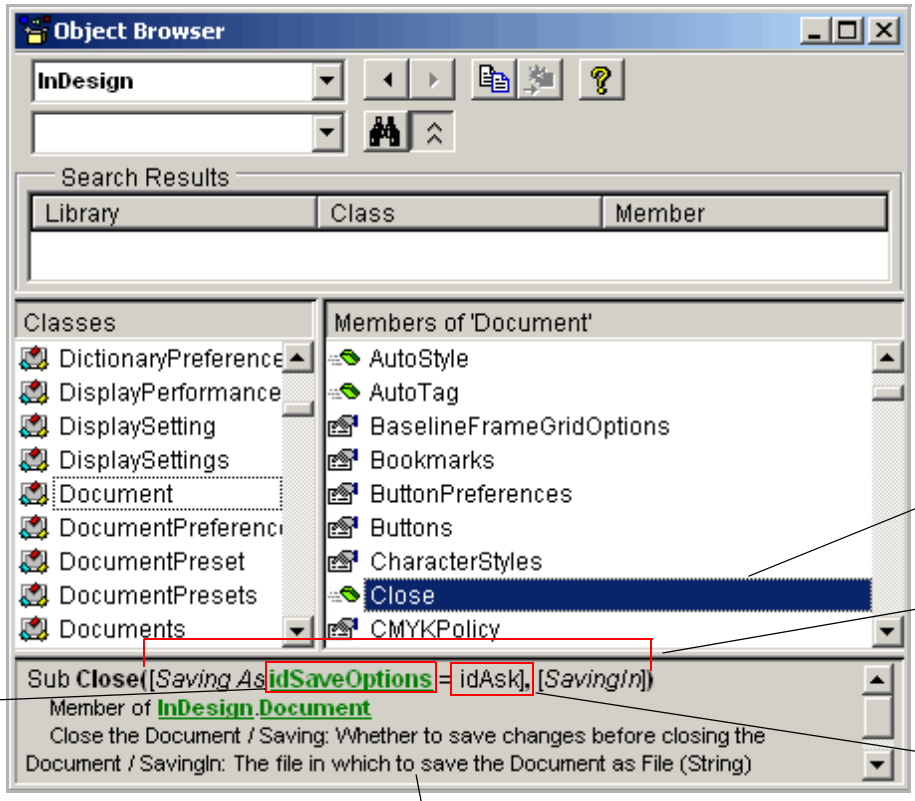


Understanding method listings

When you select a method in the **Members of** pane, the method's information is displayed in the information pane at the bottom of the Object Browser window as follows:

- The method name is followed by the parameters.
  - Optional parameters are enclosed in square brackets ([ ]).
  - If no brackets appear around a parameter name, the parameter is required.
- Each parameter name is followed by the data type.
  - If the data type is an object, the data type is a hyperlink to the object.
  - If the data type is an enumeration, the enumeration name begins with the application's initials and is a hyperlink to the enumeration's information.
  - If a default value exists for a parameter, the value is listed after the datatype after an equal sign (=).

Note: The default value is used if you do not define a value for the parameter. Only optional parameters have default values.



1. Select the method in the Members of pane

The parameters are listed in parentheses after the method name, with optional parameters enclosed in square brackets ([ ])

If a default value exists, it follows an equal sign (=) **Note:** Any data type can have a default value

The data type is listed after the method name; if the datatype is an enumeration, the enumeration name begins with the application's initials and is a link to the enumeration's information

The method description appears at the bottom of the information pane

Using Adobe scripting reference documents

Adobe provides scripting references for many applications. The references are located on your installation CD.

In the scripting references, each language is documented in a separate chapter. Within each chapter, the objects are listed alphabetically. For each object, the following tables are provided:

- Elements (AS only)
- Properties
- Methods, commands, or functions

Additionally, most object sections contain a scripting sample using the object and some of its properties and methods or commands. You can use any sample script as an example or a starting point for your script, in which you may change properties or methods.

Working with an object's elements table (AS only)

Elements are the object collections contained by an object. When object contains elements, a table shows the various ways in which you can refer to the elements. For beginning scripters, the main thing to understand about the Elements table is the Name or Element column, which tells you which objects are just below the object in the containment hierarchy. For example, the following Elements table is taken from a `document` object in InDesign.

Name	Refer to by
character style	index, name, range, relative, satisfying a test, ID
layer	index, name, range, relative, satisfying a test, ID
story	index, name, range, relative, satisfying a test, ID

The information you can get from this table is that, in document objects that you create for this application, you can create `character style`, `layer`, and `story` objects.

For example:

```
tell application "Adobe InDesign CS3"
   set myDoc to make document
   set myCharStyle to make character style in myDoc with properties {name:"Bold"}
   set myLayer to make layer in myDoc
   set myStory to make story in myDoc
end tell
```

The following script statement would produce an error, because `stroke style` is not an element of this application's `document` object.

```
tell application "Adobe InDesign CS3"
   set myDoc to make document
   set myStrokeStyle to make stroke style in myDoc with properties {name:"Erratic"}
end tell
```

Working with an object's properties table

The properties table for an object lists the following:

- The properties you can use with the object
- The value type for each property

  When the value type is a constant or enumeration, the value is a presented either as a list of valid values or as a hypertext link to the constant's listing.

  When the value type is another object, the value is a presented as a hypertext link to the object's listing.
- The property's input status: *Read-only* or *Read-write*
- A description, which includes the following:
  - An explanation of what the property defines or does
  - Ranges for valid values
  - Dependencies on other properties

The following sample Properties table for an `art layer` object in Photoshop contains samples of each type of data.

Property	Value Type	What it is
bounds	`Array of 4 numbers`	Read-only. An array of coordinates that describes the bounding rectangle of the layer in the format [y1, x1, y2, x2].
kind	`LayerKind`	Read-only. The type of layer.
name	`string`	Read-write. The name of the layer.
opacity	`number (double)`	Read-write. The opacity as a percentage. (Range: 0.0 to 100.0)
textItem	`TextItem object`	Read-only. The text item that is associated with the layer. **Note:** Valid only when `kind = LayerKind.TEXT`.
visible	`Boolean`	Read-write. If true, the layer is visible.

For example:

AS

```
tell application "Adobe Photoshop CS3"
   set myDoc to make document
   set myLayer to make art layer in myDoc
   set properties of myLayer to {kind:text layer, name:"Captions", opacity:45.5, ¬
      visible:true}
   set contents of text object in myLayer to "Photo Captions"
end tell
```

Note: You cannot define the bounds of the layer because the `bounds` property is read-only.

JS

```
var myDoc = app.documents.add()
var myLayer = myDoc.artLayers.add()
   alert(myLayer.bounds) // can't set the property because it is read-only
   myLayer.kind = LayerKind.TEXT
   myLayer.name = "Captions"
   myLayer.opacity = 45.5 // can use a decimal point because the type is not integer
   myLayer.textItem.contents = "Day 1: John goes to school"
   //see the properties table for the textItem object to find the contents property
   myLayer.visible = true
```

VBS

```
Set appRef = CreateObject("Photoshop.Application")
Set docRef = appRef.Documents.Add
Set layerRef = docRef.Layers.Add
   msgBox(layerRef.Bounds) ' can't set the property because it is read-only
   layerRef.Kind = 2
   layerRef.Name = "Captions"
   layerRef.Opacity = 45.5 // can use a decimal point because the type is not integer
   layerRef.TextItem.Contents = "Day 1: John goes to school"
   //see the Properties table for the TextItem object to find the Contents property
   layerRef.Visible = true
```

Note: In JS and VBS, collection objects are kept in properties of the containing object. To determine an object's containment hierarchy, you must locate the object or objects that use the object's collection object (that is, the object's plural form) as a property. For example, `documents.layers`, or `layers.textFrames`.

Working with an object's methods table

The Methods table for an object lists the following:

- The methods you can use with the object
- The parameter(s) for each method
  - When a parameter type is a constant or another object, the value is presented as a hypertext link to the constant or object's listing. In the Methods table sample below, the parameter types `NewDocumentMode` and `DocumentFill` are constants.
  - Parameters can be required or optional. Optional parameters are indicated by square brackets (`[]`).
- Return value type(s), which is what the method produces

  When a return is a constant or another object, the value is presented as a hypertext link to the constant or object's listing. In the Methods table sample below, the return value `Document` is an object.
- A description, which defines what the method does

The following sample Methods table lists the parameters for the `add` method for a Photoshop CS3 document.

Method	Parameter Type	Returns	What it does

`add`
`([width]`
`[, height]`
`[, resolution])`
`[, name]`
`[, mode])`
`[, initialFill]`
`[, pixelAspectRatio])`
	`UnitValue`
	`UnitValue`
	`number (double)`
	`string`
	`NewDocumentMode`
	`DocumentFill`
	`number (double)`
		`Document`	Adds a document object.
			(`pixelAspectRatio` Range: `0.10` to `10.00`)

In the preceding table:

- All of the parameters are optional, as indicated by the square brackets.
- The `width` and `height` parameters default to the current ruler units, and therefore the data type is listed as `UnitValue`. In other words, if the current vertical ruler unit is inches and the horizontal ruler unit is centimeters, the following statement will create a document that is 5 inches wide and 7 centimeters tall:
  - AS

    ```
    make document with properties {width:5, height:7}
    ```

  - JS

    ```
    app.documents.add(5, 7)
    ```

  - VBS

    ```
    appRef.Documents.Add(5, 7)
    ```

- `mode` and `initialFill` take constant values.

The following script statements define values for each of the parameters listed in the sample methods table.

AS

```
make documement with properties {width:5, height:7, resolution:72,¬
name:"Diary", mode:bitmap, initial fill:transparent, pixel aspect ratio: 4.7}
```

JS

```
app.documents.add(5, 7, 72, "Diary", NewDocumentMode.BITMAP,
   DocumentFill.TRANSPARENT, 4.7)
```

VBS

```
appRef.Documents.Add(5, 7, 72, "Diary", 5, 3, 4.7 )
```

4 Advanced scripting techniques

Most scripts do not proceed sequentially from beginning to end. Often, scripts take different paths depending on data gleaned from the current document, or they repeat commands multiple times. *Control structures* are the script language features that enable your scripts to do such things.

Conditional statements

if statements

If you could talk to your Adobe application, you might say, "If the document has only a single layer, then create another layer." This is an example of a *conditional statement*. Conditional statements make decisions—they give your scripts a way to evaluate something, such as the number of layers, and then act according to the result. If the condition is met, then the script performs the action included in the `if` statement. If the condition is not met, then the script skips the action included in the `if` statement.

Each of the following scripts opens a document and then checks whether the document contains a single layer. If only one layer exists, the script adds a layer and sets the new layer's fill opacity to 65%.

AS

An `if` statement in AS begins with the word `if`, followed by the comparison phrase in parentheses, followed by the word `then`. You must close the if statement with `end if`.

```
tell application "Adobe Photoshop CS3"
   --insert the name of your hard drive at the beginning of the filepath
   set myFilepath to alias "Hard Drive Name:Applications:Adobe Photoshop CS3:¬
      Samples:Ducky.tif"
   open myFilepath
   set myDoc to current document
   tell myDoc
      if (art layer count = 1) then
         set myLayer to make art layer with properties {fill opacity:65}
      end if
   end tell
end tell
```

Note: AS uses a single equal sign (=) for comparing values.

Now close Ducky.tif and try the script again, but change the `if` statement to the following:

```
      if (art layer count < 1) then
```

JS

An `if` statement in JS begins with the word `if`, followed by the comparison phrase in parentheses. Enclose the action in the `if` statement in curly braces ({ }).

```
var myDoc = app.open(File("/c/Program Files/Adobe/Adobe Photoshop
   CS2/Samples/Ducky.tif"));
if(myDoc.artLayers.length == 1){
   var myLayer = myDoc.artLayers.add()
   myLayer.fillOpacity = 65
   }
```

Note: JavaScript uses a double equal sign (==) for comparing values, as opposed to the single equal sign (=) used for assigning values to properties or variables.

Now close Ducky.tif and try the script again, but change the `if` statement to the following:

```
if(myDoc.artLayers.length < 1){
```

VBS

An `if` statement in VBS begins with the word `If`, followed by the comparison phrase, followed by the word `Then`. You must close the `if` statement with `End If`.

```
Set appRef = CreateObject("Photoshop.Application")
Set myDoc = appRef.Open("/c/Program Files/Adobe/Adobe Photoshop_
   CS2/Samples/Ducky.tif")
   If myDoc.ArtLayers.Count = 1 Then
      Set myLayer = myDoc.ArtLayers.Add
      myLayer.FillOpacity = 65
   End If
```

Note: VBS uses a single equal sign for both comparing and assigning values.

Now close Ducky.tif and try the script again, but change the `if` statement to the following:

```
   If myDoc.ArtLayers.Count < 1 Then
```

if else statements

Sometimes, you might have a slightly more complicated request, such as, "If the document has one layer, set the layer's fill opacity to 50%—but if the document has two or more layers, set the fill opacity of the active layer to 65%." This kind of situation calls for an `if else` statement.

AS

```
tell application "Adobe Photoshop CS3"
   --insert the name of your hard drive at the beginning of the filepath
   set myFilepath to alias "Hard Drive Name:Applications:Adobe Photoshop CS2:¬
      Samples:Ducky.tif"
   open myFilepath
   set myDoc to current document
   tell myDoc
      if (count of art layers < 2) then
         set fill opacity of current layer to 50
      else
         set fill opacity of current layer to 65
      end if
   end tell
end tell
```

JS

```
var myDoc = app.open(File("/c/Program Files/Adobe/Adobe Photoshop
   CS3/Samples/Ducky.tif"));
if(myDoc.artLayers.length < 2){
   myDoc.activeLayer.fillOpacity = 50
   }
else{
   myDoc.activeLayer.fillOpacity = 65
   }
```

VBS

```
Set appRef = CreateObject("Photoshop.Application")
Set myDoc = appRef.Open("/c/Program Files/Adobe/Adobe Photoshop CS3/_
   Samples/Ducky1.tif")
If myDoc.ArtLayers.Count < 2 Then
   myDoc.ActiveLayer.FillOpacity = 50
Else
   myDoc.ActiveLayer.FillOpacity = 65
End If
```

Loops

You may want your script to find and change all objects of a certain type. For example, your document may have some visible layers and some invisible layers, and you want to make all of the layers visible. You would like this script to work for several documents, but your documents have varying numbers of layers.

This is a situation in which a `repeat` statement (AS) or a loop (JS and VBS) comes in handy. A loop "walks" through a collection of objects and performs an action on each object.

To use the scripts in this section, open your Adobe application and create a document that has at least nine layers. Make some of the layers visible, and hide other layers. Save the document, and then run the script, substituting the name of your application and the `layer` object name in your application's DOM.

The basic principle behind each of these loops is that the script identifies the first layer in the element or collection and sets the layer's visibility to `true`, then identifies the next layer and repeats the action, and then identifies the following layer until each layer has been acted upon.

AS

This script uses two variables, `myLayerCount` and `myCounter`, to identify a layer and then increment the layer number until all layers in the document have been identified.

```
tell application "Adobe Illustrator CS3"
   set myDoc to current document
   tell myDoc
      set myLayerCount to (count layers)
      set myCounter to 1
      repeat while myCounter <= (myLayerCount + 1)
      set myLayer to layer myCounter
      set myLayer with properties {visible:true}
      --the next statement increments the counter to get the next layer
      set myCounter to myCounter + 1
      end repeat
   end tell
end tell
```

JS

This script uses a `for` loop, which is one of the most common techniques in JavaScript. Like the AppleScript above, the script uses two variables, `myLayerCount` and `myCounter`, to identify a layer and then increment the layer number until all layers in the document have been identified. The increment takes place in the third statement within the `for` statement: `myCounter++`. The `++` syntax adds 1 to the current value, but does not add 1 until the loop's action has been done.

The `for` loop in this script would say the following in plain English:

1. Begin with the value of `myCounter` at 0.
2. If the value of `myCounter` is less than the value of `myLayerCount`, then use the value of `myCounter` as the index for the layer assigned to `myLayer`, and set the visibility of `myLayer` to `true`.
3. Add 1 to the value of `myCounter`, and then compare `myCounter`'s new value to the value of `myLayerCount`.
4. If `myCounter` is still less than `myLayerCount`, use the new value of `myCounter` as the index of `myLayer` and set the visibility of `myLayer` to `true`, then add 1 to the value of `myCounter`.
5. Repeat until `myCounter` is no longer less than `myLayerCount`.

```
var myDoc = app.activeDocument
var myLayerCount = myDoc.layers.length

for(var myCounter = 0; myCounter < myLayerCount; myCounter++)
{var myLayer = myDoc.layers[myCounter]
   myLayer.visible = true}
```

VBS

The `For Each Next` loop in VBScript simply tells the application to set the `Visible` property of each object in the `Layers` collection in the active document to `True`. Notice that the collection is identified by the containment hierarchy of parent objects (in this case by the variable `myDoc`) followed by the collection name, which is the plural form of the object name (in this case `Layers`).

```
Set appRef = CreateObject("Illustrator.Application")
Set myDoc = appRef.ActiveDocument

For Each object in myDoc.Layers
object.Visible = True
Next
```

Note: The object named in the loop can be anything. The script works the same if you substitute `x` for `object` as in the following script.

```
Set appRef = CreateObject("Illustrator.Application")
Set myDoc = appRef.ActiveDocument

For Each x in myDoc.Layers
x.Visible = True
Next
```

More information about scripting

Each scripting language contains many more devices and techniques for adding power and complexity to your scripts. To continue learning how to script your Adobe applications, please refer to the Adobe scripting guide for your application. Also, see "Bibliography" on page 50.

5 Troubleshooting

This chapter explains how to interpret some basic error messages that you may receive when you run a script.

Reserved words

Script Editor and the ESTK, as well as many other scripting editors, highlight certain words when you type them.

For example, the Boolean values `true` and `false` are always highlighted. Other examples are listed below.

AS

```
tell
end
with
set
```

JS

```
var
if
else
with
```

VBS

```
Dim
Set
MsgBox
```

These highlighted words are reserved by the scripting language for special purposes and cannot be used as variable names. You can use reserved words as part of a string, because they are enclosed in quotes. You can also use them in comments, because comments are ignored by the scripting engine.

If your script indicates a syntax error, check to make sure you have not improperly used a reserved word. For a full list of reserved words in your scripting language, refer to one of the resources listed in Chapter 6, "Bibliography" on page 50.

AppleScript Script Editor error messages

When your AppleScript script has an error, the Script Editor highlights the offending part of the script and displays an error message.

Check the highlighed portion of the script for spelling and punctuation. If you do not find an error in the highlighted text, check the text that immediately precedes the highlight. If the preceding text contains an error, the error may have caused the script engine to expect something other than what it found in the highlighted section.

Some common error messages are explained below.

- *Can't get* `object`: Usually, you have not adequately defined the object in the containment hierarchy. Try adding `in parent object` (where `parent object` is the object that contains the object indicated in the error message) after the object name in your script, or create a nested `tell` statement that names the parent object.
- *Expected "" but found end of script*: Make sure all quotes are closed around strings.
- *Requested property not available for this object*: Check the spelling of all properties.

Tip: Choose **Result Log** at the bottom of the Script Editor window to view your script's progress line by line.

ESTK error messages

The ESTK alerts you to errors in several ways:

- If your script contains a syntax error, the script does not run and the offending section of the script is highlighted in gray. Often, a description of the problem is displayed in the status bar at the bottom of the ESTK window.

  When a syntax error occurs, check the following:

  - Make sure your use of upper and lower case is correct. Remember, all terms in JavaScript (except enumeration names) begin with a lowercase letter and use upper case for the first letter in each word in a combined term, such as `artLayer`.

    Also, remember that variable names are case-sensitive.
  - Close all parentheses, curly braces, quotes. Make sure each of these are in pairs.
  - Make sure quote marks are straight quotes. Also, don't mix single and double quotes. For example:
    - Incorrect: `myDoc.name = "My Document'`
    - Correct: `myDoc.name = 'My Document'`
    - Correct: `myDoc.name = "My Document"`

  Note: Some syntax errors, such as curly quotes or smart quotes, are highlighted in red. The status bar message says simply "Syntax error". Make sure you use straight quotes.
- If your script contains a runtime error, such as an object that is not correctly identified or a property that does not exist for the object that is trying to use it, the offending statement is highlighted but the script keeps running, as indicated by the swirling icon in the lower right corner. Additionally, the error is described both in the JavaScript Console pane and in the status bar.

  When a runtime error occurs:

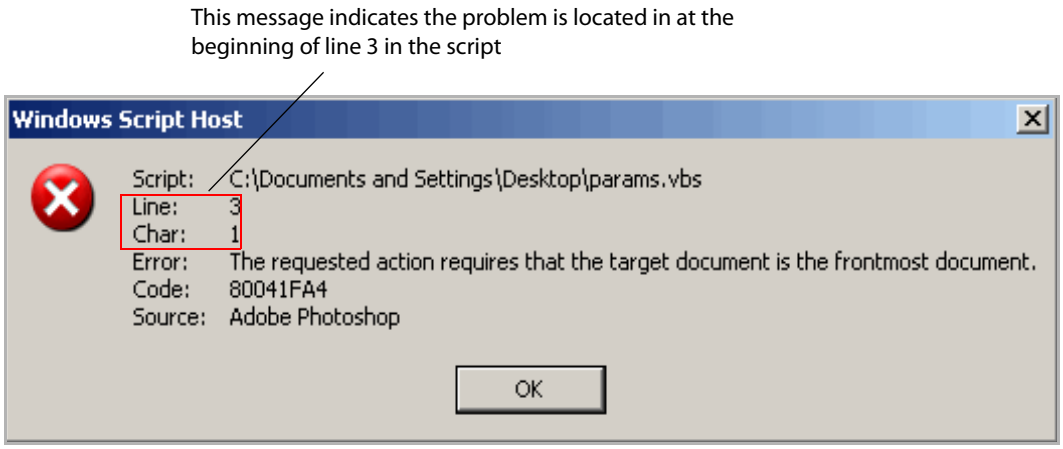
  - Choose **Debug > Stop**, or press **Shift+F5** to stop the script.
  - Look in the JavaScript Console to find the nature of the error. The following brief descriptions of some common error messages can help you know where to start.
    - *element is undefined* If the undefined element is a variable, make sure the variable name is spelled correctly and uses the correct case. Also, make sure the variable has been either defined with a `var` statement or assigned a value.

      If the undefined element is a string value, make sure the value is in quotes.
    - *undefined is not an object* Make sure the object in the highlighted statement is identified correctly in the containment hierarchy. For example, if the object is a layer, make sure you have

defined which document contains the layer. For document objects, it may be necessary to include the parent object `app`.

VBScript error messages

When your VBScript script contains an error, a Windows Script Host displays an error message that identifies the line in which the error occurred and the position within the line where the offending syntax or object begins.



6 Bibliography

This chapter contains a list of scripting books for beginners. This is only a partial list. You can also search the Internet for online tutorials in your scripting language.

AppleScript

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

JavaScript

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.

VBScript

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

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