

WEB DEVELOPMENT & DESIGN FOUNDATIONS WITH HTML5 7TH EDITION

Chapter 14 Key Concepts

LEARNING OUTCOMES

- ▶ In this chapter, you will learn how to:
 - ▶ Describe common uses of JavaScript in web pages.
 - ▶ Describe the purpose of the Document Object Model and list some common events.
 - ▶ Create a simple JavaScript using the script element and the alert() method.
 - ▶ Use variables, operators and the if control structure.
 - ▶ Create a basic form validation script.
 - ▶ Describe common uses of jQuery.
 - ▶ Describe how to obtain jQuery.
 - ▶ Use jQuery selectors and methods.
 - ▶ Configure an image gallery with jQuery.
 - ▶ Describe the purpose of jQuery plugins.

WHAT IS JAVASCRIPT?

- ▶ Object-based scripting language
- ▶ Works with the objects associated with a Web page document
 - ▶ the window
 - ▶ the document
 - ▶ the elements
 - ▶ such as forms, images, hyperlinks, etc.

WHAT IS JAVASCRIPT?

- ▶ Originally developed by Netscape
 - ▶ Named LiveScript
- ▶ Netscape & Sun Microsystems Collaboration
 - ▶ LiveScript renamed JavaScript
- ▶ JavaScript is NOT Java

COMMON USES OF JAVASCRIPT

- ▶ Display a message box
- ▶ Select list navigation
- ▶ Edit and validate form information
- ▶ Create a new window with a specified size and screen position
- ▶ Image Rollovers
- ▶ Status Messages
- ▶ Display Current Date
- ▶ Calculations

CODING JAVASCRIPT

- ▶ JavaScript statements can be coded on a web page using two different techniques:
 - ▶ Place JavaScript code between `<script>` tags
 - ▶ Place JavaScript code as part of an event attached to an HTML element

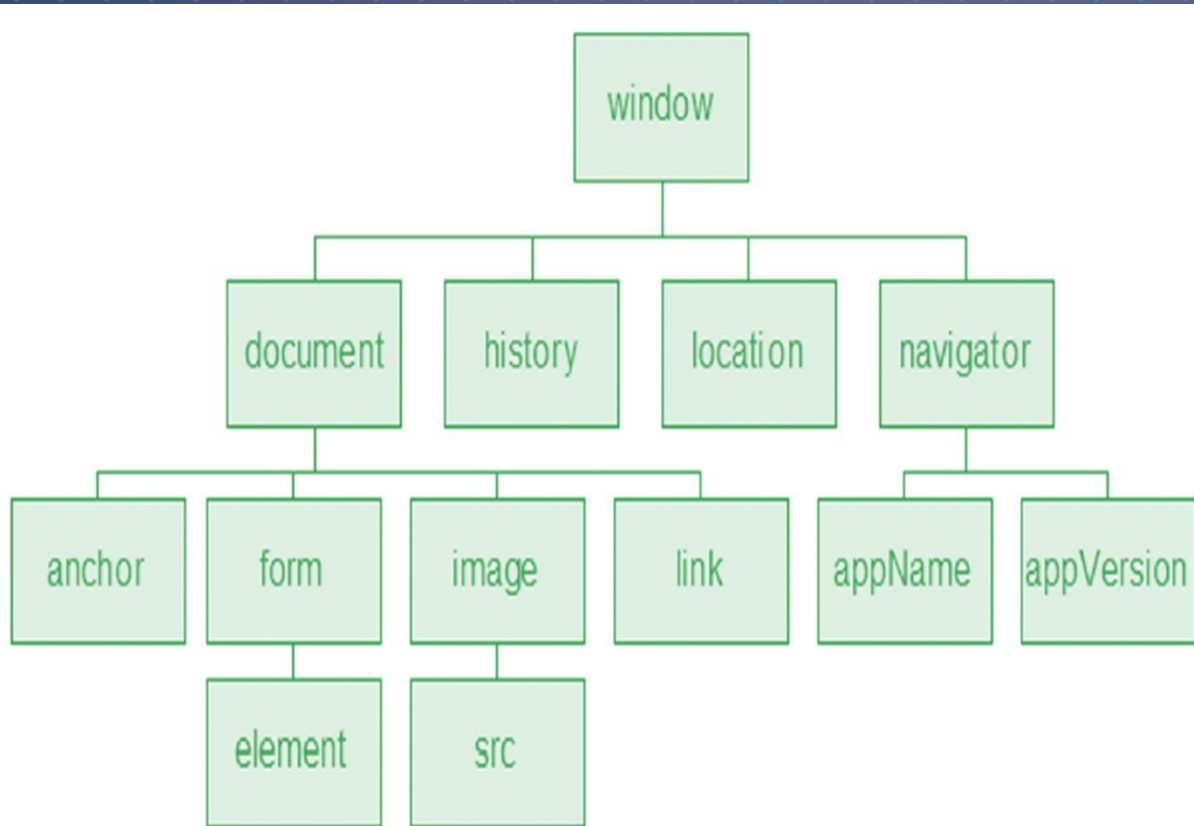
- The script element
 - A container tag
 - May be placed in either the head or the body section of a web page

```
<script type="text/javascript">  
<!--  
alert("Welcome to Our Site");  
// -->  
</script>
```

CHECKPOINT

1. Describe at least three popular uses for JavaScript.
2. How many JavaScript code blocks can be embedded in an HTML document?
3. Describe a method that can be used to find an error in a JavaScript code block.

DOCUMENT OBJECT MODEL (DOM)



- A portion of the DOM is shown at the left.
- Defines every object and element on a web page
- Hierarchical structure
- Accesses page elements and apply styles to page elements

OBJECT

- ▶ An object is a thing or entity.
 - ▶ Browser window
 - ▶ Submit button
 - ▶ Web page document

PROPERTY

- ▶ A property is a characteristic or attribute of an object.
 - ▶ The background color of a web page document
document.bgcolor
 - ▶ The date the web page file was last modified
document.lastmodified
 - ▶ The src file of an image object
image1.src

METHOD

- ▶ A method is an action (a verb)
 - ▶ Writing text to a web page document
`document.write()`
 - ▶ Submitting a form
`form1.submit()`

JAVASCRIPT AND EVENTS

- Events:
actions taken by the web page visitor
 - clicking (onclick),
 - placing the mouse on an element (onmouseover),
 - removing the mouse from an element (onmouseout),
 - loading the page (onload),
 - unloading the page (onunload), etc.

EVENTS

Event	Event Handler
click	onclick
load	onload
mouseover	onmouseover
mouseout	onmouseout
submit	onsubmit
unload	onunload

JAVASCRIPT AND EVENTS

- ▶ JavaScript can be configured to perform actions when events occur.
 - ▶ The event name is coded as an attribute of an HTML tag
 - ▶ The value of the event attribute contains the JavaScript code

Example:

Display an alert box when the mouse is placed over a hyperlink.

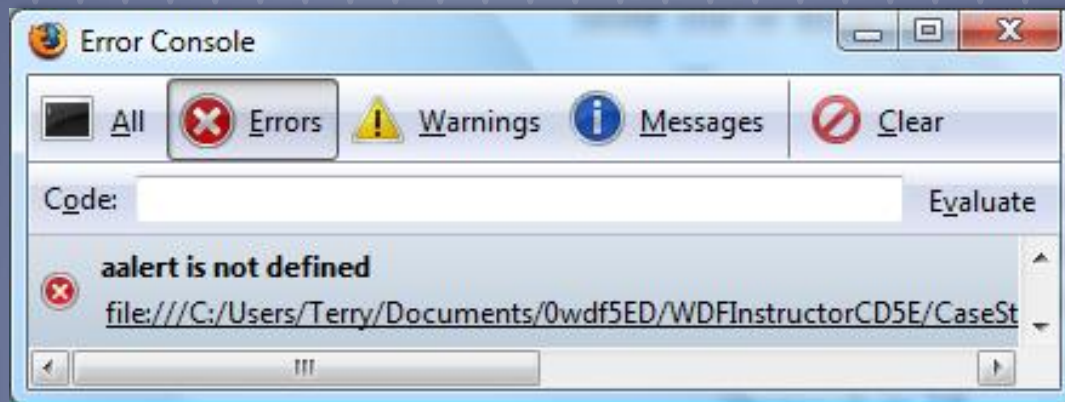
```
<a href="home.htm" onmouseover="alert('Click to go home')">Home</a>
```

JAVASCRIPT DEBUGGING(1)

- Check the syntax of the statements
 - Pay very close attention to upper and lower case letters, spaces, and quotations
- Verify that you have saved the page with your most recent changes
- Verify that you are testing the most recent version of the page (refresh or reload the page)
- If you get an error message, use the error messages that are displayed by the browser
 - In Firefox: Select Tools > Error Console

JAVASCRIPT DEBUGGING(2)

- ▶ Use the Firefox browser:
 - ▶ Select Tools > Error Console from the Menu
 - ▶ The Error Console will indicate an issue and the line number
 - ▶ This may not be exactly where the problem is
 - ▶ Sometimes the error is a one or two lines above the indicated line number.



CHECKPOINT

1. *With respect to objects, describe the difference between a property and a method. Feel free to use words like “thing,” “action,” “description,” “attribute,” and so forth.*
2. *What is the difference between an event and an event handler?*
3. *Where are event handlers placed in the HTML document?*

VARIABLE

- ▶ A variable is a placeholder for information.
- ▶ The variable is stored in the computer's memory (RAM).

```
var userName;  
  
userName = "Karen";  
  
document.write(userName);
```

PROMPTS

▶ `prompt()` method

- ▶ Displays a message and accepts a value from the user

```
myName = prompt("prompt message");
```

- ▶ The value typed by the user is stored in the variable `myName`

ARITHMETIC OPERATORS

Operator	Description	Example	Value of Quantity
=	assign	quantity = 10	10
+	addition	quantity = 10 + 6	16
-	subtraction	quantity = 10 - 6	4
*	multiplication	quantity = 10 * 2	20
/	division	quantity = 10 / 2	5

COMPARISON OPERATORS

Operator	Description	Example	Sample values of quantity that would result in true
<code>==</code>	Double equals sign (equivalent) “is exactly equal to”	<code>quantity == 10</code>	10
<code>></code>	Greater than	<code>quantity > 10</code>	11, 12 (but not 10)
<code>>=</code>	Greater than or equal to	<code>quantity >= 10</code>	10, 11, 12
<code><</code>	Less than	<code>quantity < 10</code>	8, 9 (but not 10)
<code><=</code>	Less than or equal to	<code>quantity <= 10</code>	8, 9, 10
<code>!=</code>	Not equal to	<code>quantity != 10</code>	8, 9, 11 (but not 10)

DECISION MAKING

```
if (condition) {  
    ... commands to execute if condition is  
    true  
}  
else {  
    ... commands to execute if condition is  
    false  
}
```

FUNCTION

- ▶ A function is a block of one or more JavaScript statements with a specific purpose, which can be run when needed.

```
function function_name() {  
    ... JavaScript statements ...  
}
```


Defining the Function

```
function showAlert() {  
    alert('Please click OK to continue.');  
}
```

Calling the Function

```
showAlert();
```

CHECKPOINT

1. Describe a method that can be used to gather a piece of data such as the user's age.
2. Write the JavaScript code to display an alert message for users who are under 18 years old and a different alert message for users who are 18 years or older.
3. What is a function definition?

FORM VALIDATION

- ▶ It is common to use JavaScript to validate form information before submitting it to the web server.
 - ▶ Is the name entered?
 - ▶ Is the e-mail address of correct format?
 - ▶ Is the phone number in the correct format?
- ▶ See Hands-on Practice 14.8

VALIDATING FORM FIELDS

- ▶ Use the "" or null to check to determine if a form field has information

```
if (document.forms[0].userName.value == "" ) {  
    alert("Name field cannot be empty.");  
    return false;  
} // end if
```

JAVASCRIPT & ACCESSIBILITY

- ▶ Don't expect JavaScript to always function for every visitor
 - ▶ Some may have JavaScript disabled
 - ▶ Some may be physically unable to click a mouse
- ▶ Provide a way for your site to be used if JavaScript is not functioning
 - ▶ Plain text links
 - ▶ E-mail contact info

CHECKPOINT

1. What is meant by the term “form data validation”?
2. Give three examples of form data that may require validation.
3. Should you always expect your JavaScript to “work” – why or why not?

WHAT IS JQUERY?

- ▶ jQuery is a free open-source JavaScript Library
- ▶ Provides interaction and dynamic effects on web pages
- ▶ Resources
 - ▶ <http://jquery.com>
 - ▶ <http://jquery.org>

COMMON USES OF JQUERY

- ▶ Dynamically manipulate the CSS properties of elements
- ▶ Detect and react to events – such as mouse movements
- ▶ Animate elements on a web page – such as image slideshows
- ▶ And much more...

ADDING JQUERY TO A WEB PAGE

▶ Two Options:

▶ Download jQuery

▶ <http://jquery.com/download>

▶ Access jQuery via a CDN

```
<script  
src="http://ajax.googleapis.com/ajax/libs/jquery/1.10.1/jquery.min.js">  
</script>
```

THE READY EVENT

- ▶ Triggered when the browser has loaded the Document Object Model(DOM) for the web page

```
$(document).ready(function() {
```

Your JavaScript statements and other jQuery statements go here

```
})
```

DISPLAY AN ALERT WHEN THE PAGE LOADS

```
<script>  
$(document).ready(function() {  
  alert("Ready for jQuery");  
})  
</script>
```



JQUERY SELECTORS

- ▶ A selector indicates which DOM elements jQuery will affect
- ▶ <http://api.jquery.com/category/selectors>
- ▶ Some commonly used jQuery selectors

Selector	Purpose
<code>\$('*')</code>	wildcard – selects all elements
<code>\$('li')</code>	HTML element selector – selects all li elements
<code>\$('.myclass')</code>	Class selector – selects all elements assigned to the class named myclass
<code>\$('#myid')</code>	Id selector – selects the element assigned to the id named myid
<code>\$('nav a')</code>	HTML element selector – selects all anchor elements contained within the nav element
<code>\$('#resources a')</code>	Id selector and HTML element selector – selects all anchor elements contained within the id named resources
<code>\$('li:first')</code>	Positional selector that selects the first element of that type on the page
<code>\$('li:odd')</code>	Positional selector- selects every other li element on the page

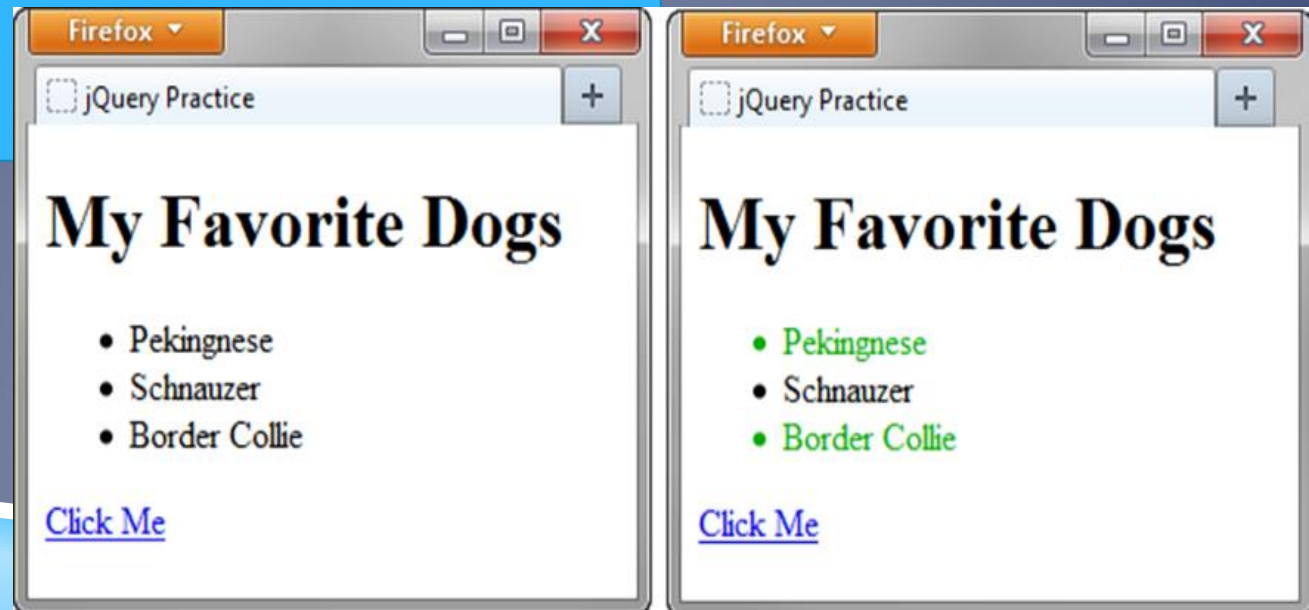
JQUERY METHODS

- ▶ A method acts upon the DOM elements you have selected
- ▶ <http://api.jquery.com>
- ▶ Some commonly used jQuery methods

Method	Purpose
<code>click()</code>	Binds a jQuery event handler to the JavaScript click event
<code>css()</code>	Sets the specified CSS property for the selected element(s)
<code>fadeToggle()</code>	Displays or hides the selected element(s) by animating their opacity
<code>hover()</code>	Binds a jQuery event handler to the JavaScript onmouseover event
<code>slideToggle()</code>	Displays or hides the selected element(s) with a sliding motion
<code>toggle()</code>	Displays or hides the selected element(s)
<code>attr()</code>	Gets or sets attributes for the selected element(s)
<code>html()</code>	Gets or sets HTML contents for the selected element(s)

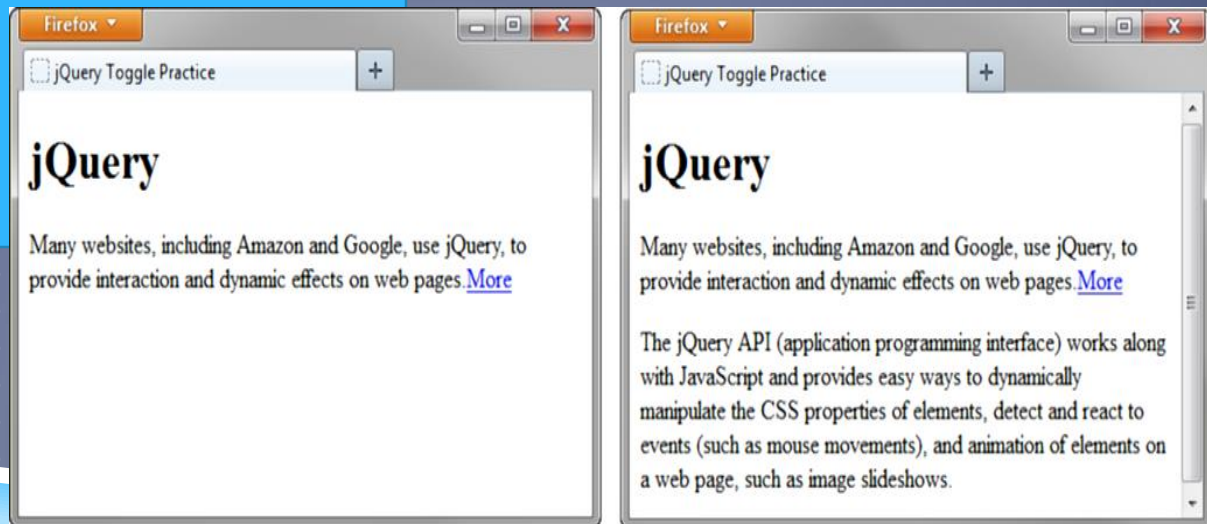
USING THE CLICK() AND CSS() METHODS

```
<script>
$(document).ready(function() {
  $('a').click(function(){
    $('li:even').css('color','#006600');
  });
});
</script>
```



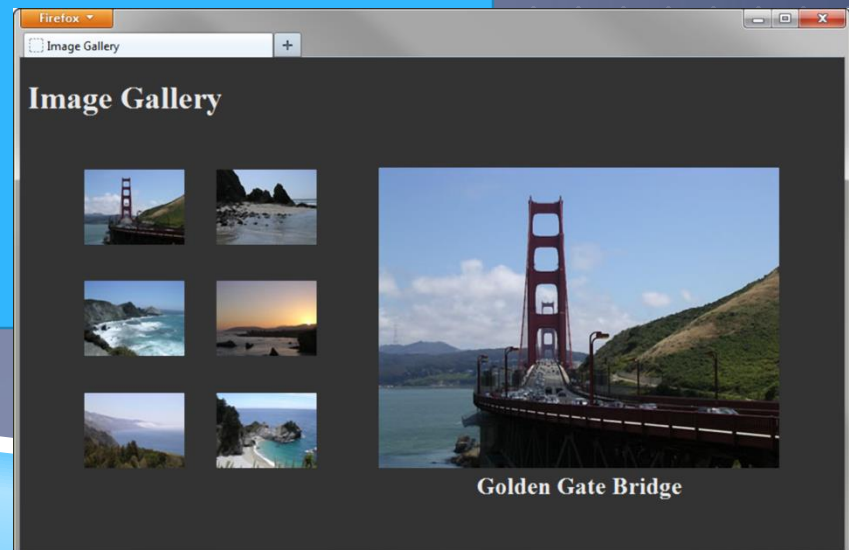
USING THE TOGGLE() METHOD

```
<script>
$(document).ready(function() {
    $('#more').click(function(){
        $('#details').toggle();
    });
});
</script>
```



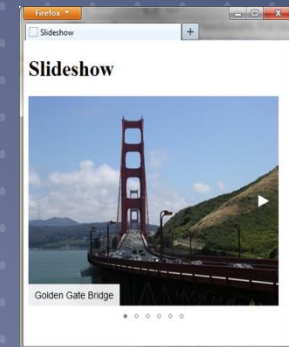
JQUERY IMAGE GALLERY

```
<script>
$(document).ready(function(){
  $('#gallery a').click(function(){
    var galleryHref = $(this).attr('href');
    var galleryAlt = $(this).attr('title');
    $('figure img').attr({ src: galleryHref, alt: galleryAlt });
    $('figcaption').html(galleryAlt);
    return false;
  });
});
</script>
```



JQUERY PLUGIN

- ▶ JavaScript that extends the functionality of jQuery
- ▶ <http://plugins.jquery.com>
- ▶ MIT license:
<http://opensource.org/licenses/MIT>
- ▶ Examples:
 - ▶ fotorama plugin
 - ▶ <http://plugins.jquery.com/fotorama>
 - ▶ Validate plugin
 - ▶ <http://plugins.jquery.com/validation>



CHECKPOINT

1. Describe the two ways the web developers can obtain the jQuery JavaScript Library
2. Explain the purpose of the `css()` method.
3. Describe the purpose of the ready event.

SUMMARY

This chapter introduced the use of JavaScript and jQuery on web pages.