

# Beginning JavaScript with DOM Scripting and Ajax

From Novice to Professional



Christian Heilmann

## **Beginning JavaScript with DOM Scripting and Ajax: From Novice to Professional**

**Copyright © 2006 by Christian Heilmann**

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without the prior written permission of the copyright owner and the publisher.

ISBN-13 (pbk): 978-1-59059-680-7

ISBN-10 (pbk): 1-59059-680-3

Printed and bound in the United States of America 9 8 7 6 5 4 3 2 1

Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, we use the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

Lead Editors: Charles Brown, Chris Mills

Technical Reviewer: Jon Stephens

Editorial Board: Steve Anglin, Ewan Buckingham, Gary Cornell, Jason Gilmore, Jonathan Gennick, Jonathan Hassell, James Huddleston, Chris Mills, Matthew Moodie, Dominic Shakeshaft, Jim Sumser, Keir Thomas, Matt Wade

Project Manager: Beth Christmas

Copy Edit Manager: Nicole LeClerc

Copy Editor: Ami Knox

Assistant Production Director: Kari Brooks-Copony

Production Editor: Katie Stence

Compositor: Pat Christenson

Proofreader: Lori Bring

Indexer: Broccoli Information Management

Artist: April Milne

Cover Designer: Kurt Krames

Manufacturing Director: Tom Debolski

Distributed to the book trade worldwide by Springer-Verlag New York, Inc., 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax 201-348-4505, e-mail [orders-ny@springer-sbm.com](mailto:orders-ny@springer-sbm.com), or visit <http://www.springeronline.com>.

For information on translations, please contact Apress directly at 2560 Ninth Street, Suite 219, Berkeley, CA 94710. Phone 510-549-5930, fax 510-549-5939, e-mail [info@apress.com](mailto:info@apress.com), or visit <http://www.apress.com>.

The information in this book is distributed on an “as is” basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the author(s) nor Apress shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this work.

The source code for this book is available to readers at <http://www.beginningjavascript.com> and <http://www.apress.com>.

# Contents

Foreword.....	xiii
About the Author .....	xv
About the Technical Reviewer.....	xvii
Acknowledgments.....	xix
Introduction .....	xxi
<b>CHAPTER 1    Getting Started with JavaScript.....</b>	<b>1</b>
The Why of JavaScript.....	3
What Is JavaScript? .....	4
Problems and Merits of JavaScript .....	5
Why Use JavaScript If It Cannot Be Relied On?.....	6
JavaScript in a Web Page and Essential Syntax .....	7
JavaScript Syntax .....	8
Code Execution .....	9
An Aside About Functions .....	11
Objects .....	12
Simple JavaScript Example .....	13
Summary .....	16
<b>CHAPTER 2    Data and Decisions .....</b>	<b>17</b>
Data, Data Types, and Data Operators .....	18
The String Data Type .....	18
Operators .....	21
JavaScript Variables .....	23
Converting Different Types of Data .....	26
The Composite Data Types: Array and Object.....	30
Objects JavaScript Supplies You with: String, Date, and Math.....	30
Arrays .....	39
The Array Object's Methods and Properties .....	42

Making Decisions in JavaScript .....	45
The Logical and Comparison Operators .....	45
Conditional Statements .....	49
Testing Multiple Values: the <code>switch</code> Statement.....	52
Repeating Things: Loops .....	54
Summary .....	59
 <b>CHAPTER 3 From DHTML to DOM Scripting .....</b>	<b>61</b>
JavaScript As “the Behavior Layer” .....	63
Object Detection vs. Browser Dependence .....	65
Progressive Enhancement .....	68
JavaScript and Accessibility .....	69
Good Coding Practices .....	71
Naming Conventions .....	71
Code Layout .....	72
Commenting .....	74
Functions .....	76
Short Code via Ternary Operator .....	79
Sorting and Reuse of Functions .....	80
Variable and Function Scope .....	80
Keeping Scripts Safe with the Object Literal .....	81
Summary .....	83
 <b>CHAPTER 4 HTML and JavaScript.....</b>	<b>85</b>
The Anatomy of an HTML Document .....	85
Providing Feedback in Web Pages via JavaScript:	
The Old School Ways .....	89
Using window Methods: <code>prompt()</code> , <code>alert()</code> ,	
and <code>confirm()</code> .....	90
Accessing the Document via the DOM .....	96
Of Children, Parents, Siblings, and Values .....	99
From the Parents to the Children .....	100
From the Children to the Parents .....	102
Among Siblings .....	103
Changing Attributes of Elements .....	107

Creating, Removing, and Replacing Elements .....	109
Avoiding NOSCRIPT .....	113
Shortening Your Scripts via InnerHTML .....	115
DOM Summary: Your Cheat Sheet .....	116
DOMhelp: Our Own Helper Library .....	118
Summary .....	122

## CHAPTER 5    **Presentation and Behavior (CSS and Event Handling)** .. 123

Changing the Presentation Layer via JavaScript .....	123
Helping the CSS Designer .....	131
Changing the Document's Behavior via Event Handling .....	153
Events in the W3C-Compliant World .....	156
Fixing Events for the Non-W3C-Compliant World .....	165
Never Stop Optimizing .....	172
The Ugly Page Load Problem and Its Ugly Solutions .....	173
Reading and Filtering Keyboard Entries .....	174
The Dangers of Event Handling .....	179
Summary .....	180

## CHAPTER 6    **Common Uses of JavaScript: Images and Windows** .... 183

Images and JavaScript .....	183
Basics of Image Scripting .....	184
Preloading Images .....	186
Rollover Effects .....	187
Slide Shows .....	196
Summary of Images and JavaScript .....	211
Windows and JavaScript .....	212
Window Properties .....	213
Window Methods .....	215
Summary: Windows and JavaScript .....	238
Summary .....	239

<b>CHAPTER 7</b>	<b>JavaScript and User Interaction: Navigation and Forms . . .</b>	<b>241</b>
	Navigation and JavaScript . . . . .	241
	The Fear of the Page Reload . . . . .	242
	Basics of Navigation and JavaScript . . . . .	242
	Browser Navigation . . . . .	245
	In-Page Navigation . . . . .	246
	Site Navigation . . . . .	255
	Pagination . . . . .	263
	Summary of Navigation with JavaScript . . . . .	272
	Forms and JavaScript . . . . .	272
	Basics of Forms with JavaScript . . . . .	274
	Form Elements . . . . .	275
	Interactive Forms: Hiding and Showing Dependent Elements . . .	291
	Custom Form Elements . . . . .	297
	Summary of Forms and JavaScript . . . . .	297
	Summary . . . . .	297
<b>CHAPTER 8</b>	<b>Back-End Interaction with Ajax . . . . .</b>	<b>299</b>
	Household Cleaning Liquid, Football Club, or Flash Gordon's Spacecraft: What Is Ajax? . . . . .	300
	Et Tu, Cache? . . . . .	309
	Putting the X Back into Ajax . . . . .	309
	Replacing XML with JSON . . . . .	314
	Using Server-Side Scripts to Reach Third-Party Content . . . . .	316
	XHR on Slow Connections . . . . .	320
	A Larger Ajax Example: Connected Select Boxes . . . . .	323
	Optional Dynamic Ajax Menus . . . . .	331
	Summary . . . . .	340
<b>CHAPTER 9</b>	<b>Data Validation Techniques . . . . .</b>	<b>343</b>
	Pros and Cons of Client-Side JavaScript Validation . . . . .	343
	A Quick Reminder About Protecting Content with JavaScript . . . . .	344
	The One-Size-Fits-All Validation Myth . . . . .	345

Basic JavaScript Validation with String and Numeric Methods . . . . .	346
String Validation Methods . . . . .	346
Numeric Validation Methods . . . . .	352
Regular Expressions. . . . .	357
Syntax and Attributes . . . . .	357
Wildcard Searches, Constraining Scope, and Alternatives . . . . .	358
Restricting the Number of Characters with Quantifiers . . . . .	359
Word Boundaries, Whitespace, and Other Shortcuts . . . . .	360
Methods Using Regular Expressions . . . . .	361
The Power of Parenthesis Grouping. . . . .	361
Regular Expression Resources . . . . .	363
Summary of Validation Methods . . . . .	363
Form Validation Techniques . . . . .	364
Designating Mandatory Fields. . . . .	364
The Hidden Field Method . . . . .	364
The Indicator Element Method . . . . .	365
The CSS Classes Method . . . . .	366
The Custom Attribute Method . . . . .	366
Failures of These Methods . . . . .	367
Sharing Validation Rules . . . . .	367
Giving Users Validation Feedback . . . . .	369
Showing a List of Erroneous Fields . . . . .	369
Replacing the Main Form with a Clickable Error Message. . . . .	374
Highlighting Erroneous Fields Individually . . . . .	376
Instant Validation Feedback . . . . .	379
Other Dynamic Validation Methods . . . . .	381
Summary . . . . .	385

## ■ CHAPTER 10    **Modern JavaScript Case Study: A Dynamic Gallery** . . . . . 387

Basics of Thumbnail Galleries . . . . .	387
What Is a Thumbnail Gallery and What Should It Do? . . . . .	388
Static Thumbnail Galleries . . . . .	388
Faking Dynamic Galleries with JavaScript. . . . .	389
Displaying Captions . . . . .	396
Dynamic Thumbnail Galleries. . . . .	401
Creating an Image Badge from a Folder. . . . .	406
Summary . . . . .	414

<b>CHAPTER 11</b>	<b>Using Third-Party JavaScript</b>	415
	What the Web Offers You	415
	Code Snippets, RSS Feeds, APIs, and Libraries	416
	RSS Feeds and REST APIs	417
	Examples of REST APIs	418
	Using a Library: Short, Shorter, jQuery	419
	Dangers of jQuery and Other Libraries Using Their Own Syntax	426
	Using an API: Adding a Map to Your Site with Google Maps	427
	Full Service: The Yahoo Developer Network and User Interface Library	438
	Bouncy Headlines Using YUI	439
	Replacing Pop-Up Windows Using the YUI Connection Manager and Container Components	444
	Yahoo User Interface Library Summary	449
	Summary	450
<b>APPENDIX</b>	<b>Debugging JavaScript</b>	451
	Common JavaScript Mistakes	451
	Misspellings and Case-Sensitivity Issues	451
	Trying to Access Undefined Variables	452
	Incorrect Number of Closing Braces and Parentheses	454
	Concatenation Gone Wrong	456
	Assigning Instead of Testing the Value of a Variable	458
	Tracing Errors with <code>alert()</code> and “Console” Elements	458
	Error Handling with <code>try</code> and <code>catch()</code>	459
	Sequential Uncommenting	462
	Error Reporting in Browsers	463
	Microsoft Internet Explorer 6	463
	Safari	464
	Opera 8.5	466
	Firefox 1.5.0.3	466
	JSLint and JSUNIT	470
	Summary	470
<b>INDEX</b>		471