

MACROMEDIA

FLASH 5!

CREATIVE WEB ANIMATION



- *Covers Macromedia Flash 5's new user interface, enhanced ActionScripting, Movie Explorer, shared-symbol libraries, and more!*
- *Over 40 up-to-date full-color video tutorials!*

From simple buttons and animations to sophisticated interactive movies, you'll be designing high-impact Web sites in a flash!

DEREK FRANKLIN AND BROOKS PATTON

W / 1 CD

Includes Windows/Macintosh CD-ROM



Flash 5!

Creative Web Animation

TP 312

Derek Franklin
Brooks Patton



Flash 5! Creative Web Animation

Derek Franklin and Brooks Patton

Published by Macromedia Press, in association with Peachpit Press,
a division of Addison Wesley Longman

Macromedia Press

1249 Eighth Street
Berkeley, CA 94710
(510) 524-2178
(800) 283-9444
(510) 524-2221 (fax)

<http://www.peachpit.com>

<http://www.macromedia.com>

Copyright © 2001 by Macromedia Press Inc., Derek Franklin, and Brooks Patton

<i>Editor</i>	Jill Marts Lodwig
<i>Copyeditor</i>	Jill Simonsen
<i>Production Coordinators</i>	Kate Reber, Lisa Brazieal
<i>Compositor</i>	Rick Gordon, Emerald Valley Graphics; Myrna Vladic, Bad Dog Graphics; and Deborah Roberti, Espresso Graphics
<i>Interior Design Modifications</i>	Owen Wolfson
<i>Cover Design</i>	TMA Ted Mader Associates
<i>Indexer</i>	James Minkin
<i>Macromedia Tech Readers</i>	Erika Burbach, Jeremy Clark, Peter Davey, Jonathan Duran, and Lisa Young

Notice of Rights

All rights reserved. No part of this book or CD-ROM may be reproduced or transmitted in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. For information on getting permission for reprints and excerpts, contact Macromedia Press.

Trademark Notice

Flash, FreeHand, Director, Generator, Macromedia, and the Macromedia logo are trademarks of Macromedia Inc. Apple, QuickTime, and Macintosh are registered trademarks of Apple Computer Inc. The Peachpit logo is a registered trademark of Peachpit Press. Throughout this book, trademark names are used. Rather than put a trademark symbol in each occurrence of a trademarked name, we state we are using the names only in an editorial fashion and to the benefit of the trademark owner with no intention of infringement of the trademark.

Notice of Liability

The information in this book and CD-ROM is distributed on an "As Is" basis, without warranty. While every precaution has been taken in the preparation of the book and CD-ROM, neither the authors nor Macromedia Press 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 instructions contained in this book or by the computer software and hardware products described in it.

ISBN 0-201-71969-X

9 8 7 6 5 4 3 2 1

Printed and bound in the United States of America.

Dedication

To the awesome Flash community who made the previous edition of this book such a huge success. The support and feedback I continue to receive from you is truly inspirational. I hope this edition helps take your ambitions further and that you derive as much joy using Flash as I have.

—Derek

To my wife, Leslie; my son, Brooks Jr.; my mother, Jane; my sister, Melissa; my brothers, Leland and Wendell; my good friend, Gary; and my mother-in-law and father-in-law. Finally, to my father, whom I will forever miss and love.

—Brooks

Acknowledgments

Despite my exhaustion after grinding through the arduous schedule for this book, I have looked forward to writing this page. It gives me an opportunity to thank my friends at Peachpit, who have had every bit as much to do with this book as I have, and my family, who have been incredibly understanding and supportive during this seemingly unending marathon.

I am very much indebted to one of the most organized, motivated, and skilled editors in the business, Jill Marts Lodwig. There was never a moment when she wasn't able to make this project even better. Special thanks also to Kate Reber, production coordinator, whose patience and incredible skill has made this book one I am very proud of. Thanks to Jill Simonson, copy editor, whose ability to take my words and actually make them sound intelligent continually boggles my mind, and to composers Rick Gordon, Myrna Vladic, and Deborah Roberti for their consummate skill and attention to detail. And finally, thanks to Marjorie Baer, executive editor, and Nancy Runzel, publisher, to whom I will be forever grateful for their faith and confidence in me.

I'm also very much indebted to my awesome wife, Kathy, for putting up with my 18-hour workdays, and to my daughter, Ashlie Russell, for her maturity, which gives me one less thing to worry about. Thanks also to my brother Eddie, for providing the laughs when I needed them most, and to my brother-in-law Jackie, whose curiosities about Flash were inspirational. And finally, special thanks to my two moms—my real one and my adoptive one, Sue Stailey (my favorite mother-in-law). These ladies continue to be my biggest fans. I love you both.

—Derek

Introduction

Over the years, Macromedia Flash has developed into a tool that far exceeds its designers' original vision. What started, in 1996, as a program for creating interactive, animated GIFs has evolved into a full-scale Web development tool. Today, in addition to Web site design, developers are using Flash to create everything from product demos to e-commerce front ends to CD-ROM-based presentations—and the list continues to grow.

While Macromedia Flash has improved and evolved with each update, the latest version is more revolutionary than evolutionary. By far the most ambitious update yet, Flash 5 represents a mature platform for creating sophisticated interactive applications for the Web and CDs. If, as a Web developer, you only have time to learn one program, Flash is your ticket: As a drawing, animation, and interactivity powerhouse, Flash can take care of all your needs, and then some.

Like most things worth doing, though, Flash takes some study and practice to master. That's where we enter the picture. Drawing on our years of experience teaching and working with Flash, our goal with this new book is to help you maximize the program's potential while avoiding the pitfalls that can beset new users.

If you're familiar with the last edition, you'll notice we've made some changes—most of which are based on your feedback. The book is now divided into sections that break down the development process into its various parts. And we've added chapters on Flash's new Movie Explorer and ActionScripting engine. One thing that hasn't changed, however, are the QuickTime tutorials: They still form the heart of this book—though there are now more of them, and they've all been updated. In these tutorials, we'll teach you some tricks and techniques, as well as introduce you to the new user interface. Best of all, by watching us use the program, you'll be able to see how you can make it all come together to create your own movies and presentations.

What you'll learn...

What's in the chapters of this book

How to use the book

The Parts

Before you begin, we should explain some terminology. First, the terms *movie*, *presentation*, *content*, and *project* all refer to basically the same thing: the Flash file you create to show to the world. *Animation* in this context means any kind of onscreen movement you intentionally create. *Interactivity* refers to anything you create in Flash that reacts to viewer input—via keyboard or mouse. Finally, *multimedia* is where all of these things, including sound, come together.

Now take a look at the following list of chapters to see what's in store:

Chapter 1 — *Why Flash?* As if you had to ask. Here you'll find out why Flash 5 is the tool of choice for creating high-impact Web sites and multimedia presentations.

Chapter 2 — *Getting Started.* If you want to find out what's new in Flash 5 as well as familiarize yourself with the redesigned authoring environment and its enhancements, this is the place to go.

Chapter 3 — *Graphics.* Although some people find Flash's drawing tools limited, we believe just the opposite to be true. Here we'll show you why as well as provide an in-depth discussion of the program's powerful tool set, including Flash 5's newly designed interface for drawing and color tools and the powerful new Pen tool. If you work with FreeHand and Fireworks, this is where you can learn how to import files that you create with those programs directly into Flash.

Chapter 4 — *Text.* Although text is far from the most exciting part of a movie, it doesn't have to be boring. In this chapter, we'll show you how to use text to receive user input and liven up your presentation. You'll also learn about Flash 5's new support for HTML tags as well as font symbols.

Chapter 5 — *Sound.* Visual effects are great, but their impact is even greater if you use them in conjunction with sound. Here we show you how to harness the power of audio.

Chapter 6 — *Bitmaps.* When you add bitmap elements (or photos) to your Flash presentations, there's no limit to the visual effects you can achieve. Here, we'll show you how, and then detail some great uses for bitmaps.

Chapter 7 — *Symbols.* These “do all” elements represent the heart of Flash's Web multimedia capabilities. If you can master the use of symbols, you're halfway to handling most of what you'll encounter in Flash.

Chapter 8 — Working with Elements on the Stage. Learn how to move, align, flip, skew, and transform your movie elements in almost every way imaginable. In this chapter, you'll find out how to create new movie elements and edit existing ones on Flash's stage.

Chapter 9 — Using Layers to Separate Content and Functionality. Learning how to use layers is the first step in creating an interactive presentation. Here we'll show you how to use them to separate the content and functionality within your movie, and how they help give it dimension and depth.

Chapter 10 — Using Animation to Build Movement. Bring your movie to life with frame-by-frame and tweened animation. In this chapter, we'll describe techniques, as well as teach you how to create flowing transitions and deal with processor issues that may hinder the playback of your movie.

Chapter 11 — Basic Actions for Building Interactivity. Learn how to engage your viewer by creating dynamic, interactive presentations.

Chapter 12 — Using ActionScript for Advanced Interactivity. Want to take your presentations to the next level? With an understanding of Flash 5's new professional scripting capabilities, you'll be able to create complete Web applications, printable movies, games, and more.

Chapter 13 — Using the Library to Manage Your Assets. A movie contains many elements; Flash's library is where you keep track of them all. In this chapter we'll show you how to organize your movie assets in the library as well as describe Flash 5's new shared libraries—the answer to easy updates to your content, as well as revision control issues that can arise from working on group authoring projects on multiple machines.

Chapter 14 — Using Movie Explorer to Manage Structure. If you want a blueprint of your movie project, this is your tool. In this chapter we'll show you how to use Flash 5's new Movie Explorer to analyze and manage your project.

Chapter 15 — Testing. With so many things to consider when creating a Flash movie, things can sometimes slip through the cracks. Here, we'll show you how to use Flash's testing tools to create compact, smooth-running, error-free movies.

Chapter 16 — Publishing. All your hard work is for naught if you're unable to share the final product. Here we'll familiarize you with the many formats in which Flash allows you to present your work, and describe the potential and appropriate uses of each. You'll also learn about how to place a Flash movie on an HTML page and how to deal with plug-ins.

How to Use This Book

We've tried to organize this book so that it echoes a Flash presentation's stages of development, first discussing the elements that make up a movie, then proceeding on to discuss movie management, movie production, and movie distribution. Although we recommend that you go through this book from front to back, sections are organized so that you can easily reference them in the future. The book also includes plenty of tips, tricks, warnings, and other learning aids to keep you on track. And the CD-ROM contains the QuickTime video tutorials that accompany most chapters (as well as a QuickTime installer so that you can view the movies). The CD also contains the tutorials' associated source files, which you can open in Flash to see what makes them tick.

With this revision, we've worked hard to make this book as easy, enjoyable, and informative as possible. Now it's up to you to take the information and run with it. We'd love to hear of your successes as well as view what you've created. Contact us at flash5@derekfranklin.com or flash5@crazyraven.com. Although we may not be able to respond to all of your emails, we'll certainly do our best. Tell us what you think of the book and what you'd like to see in future editions. We'll be listening.

Contents

Introduction	ix
Chapter 1 Why Flash?	1
Speed	1
Web Standard	4
Interactivity	5
Ease of Use	6
Design Capabilities	7
Versatility	8
Widespread Viewability	9
Integration	9
Chapter 2 Getting Started	11
How Flash Works	11
What's New in Flash 5	14
Interface	16
Options and Settings	36
Setting Movie Properties	44
The QuickTime Interactive Tutorials	46
Chapter 3 Graphics	47
Tools and Options	48
Drawing Tasks	56
Using the Pen Tool	63
Pen and Drawing Preferences	69
Editing Simple Shapes	70
Strokes and Fills	74
Importing Vector Graphics	85
Optimizing Graphics	88
Using Color	89
Interactive Tutorial	100
Chapter 4 Text	101
What Is Text?	102
Creating Text Elements	102
Working with Text Elements	106
Using Font Symbols for Dynamic Type Styling	121
Breaking Text Apart	124
Animation Considerations	124
Interactive Tutorial	126

Chapter 5 Sound	127
Understanding Sound	128
Importing Sounds	129
Adding Sounds to the Timeline	130
Configuring/Editing Sound Instances	132
Sound Properties	139
Updating Sounds	143
Advanced Sound Capabilities	146
Using Sounds in Shared Libraries	146
Interactive Tutorials	146
Chapter 6 Bitmaps	147
Importing Bitmaps	148
Adding Bitmaps to Your Movie	150
Working with Bitmaps	150
Bitmap Properties	156
Optimizing Your Images	158
Updating Bitmaps	161
Using Bitmaps in Shared Libraries	162
Using Animated GIFs	163
Using PNGs	165
Interactive Tutorial	166
Chapter 7 Symbols	167
Understanding Symbols and Instances	167
Creating Symbols	171
Editing Symbols	179
Working with Instances	182
Interactive Tutorials	190
Chapter 8 Working with Elements on the Stage	191
Selecting	191
Groups	197
Placing Elements on the Stage	198
Transforming Elements	207
Duplicating Elements	213
Cutting, Copying, Deleting, and Pasting	213
Interactive Tutorial	214

Chapter 9 Using Layers to Separate Content and Functionality	215
Understanding Layers	216
Working with Layers	218
Identifying Graphical Elements on Different Layers	224
Using Guide Layers	226
Special-Purpose Layers	227
Layer Properties	232
Interactive Tutorials	234
Chapter 10 Using Animation to Build Movement	235
How Animation Works	236
Understanding the Timeline	238
Working with Scenes	245
Frames	247
Creating Animation	258
Putting It All Together	271
Using QuickTime Video	275
Interactive Tutorials	276
Chapter 11 Basic Actions for Building Interactivity	277
Interactivity in Flash	278
Actions Panel	289
Basic Actions in Depth	298
Interactive Tutorials	316
Chapter 12 Building Advanced Interactivity Using ActionScript	317
What Is ActionScript?	318
Thinking Like a Programmer	320
Variables	323
Operators	334
Expressions	342
Statements	344
Functions	352
Working with Multiple Timelines	358
Objects	383
Smart Clips	397
The Actions Panel Options Menu	398
Printing	399
Interactive Tutorials	405

Chapter 13 Using the Library to Manage Your Assets	407
The Interface	408
Managing Library Assets	410
Working with Symbols in the Library Window	413
Working with Sounds, Bitmaps, and Videos in the Library Window	415
Viewing and Organizing Library Items	416
Special Libraries	418
Interactive Tutorials	424
Chapter 14 Using Movie Explorer to Manage Structure	425
Understanding the Display List	426
Movie Explorer Tasks	434
Interactive Tutorial	438
Chapter 15 Testing	439
Getting Ready to Test	439
Testing Within the Flash Authoring Environment	440
The Test Movie and Test Scene Commands	442
The Testing Environment	443
Chapter 16 Publishing Your Work	457
Delivery Methods	457
Flash and HTML	485
Player Issues	497
Understanding Templates	498
Interactive Tutorial	506
Appendix A On the CD	507
Appendix B Keyboard Shortcuts	509
Appendix C Resource Sites	517
Appendix D Third-Party Software	521
Index	525

Why Flash?

CHAPTER 1

What you'll learn...

The advantage of vector graphics

The advantages of streaming

Flash's Web capabilities

Flash's enhanced interactivity

A better question might be *Why not* Flash? As an increasingly popular standard, Macromedia Flash is ubiquitous these days. From the Web, to cell phones, to Internet-enabled appliances and personal digital assistants (PDAs), businesses the world over are using Flash to market their products and to do e-commerce right. The reason the Web development community is so crazy about Flash? There's simply nothing that compares when it comes to creating interactive, high-impact content. And it doesn't hurt that Flash is cool, hip, and fun to use, too!

The key to Flash's popularity, though, is its powerful multimedia capabilities—features that have enabled Flash to transform the Web from the text/graphics medium that it was a few years ago into the multisensory, interactive experience it has become today. A painstakingly produced Flash movie can be as enjoyable as a well-orchestrated symphony. And like a symphony, it brings together a number of elements—sound, movement, interaction—to produce some extraordinary results.

Need more convincing? Probably not. But read on anyway to learn about some of the other aspects of Flash that make it such an appealing tool for creating next-generation Web content.

Speed

One thing that makes Flash such an incredible Web development tool is its use of vector graphics as the default graphics mode. Vector graphics are objects defined by mathematical equations, or vectors, that include information about the object's size, shape, color, outline, and position. This efficient mode of handling graphics keeps files relatively small—even when you're dealing with complex drawings. What's more, because vector graphics are resolution independent, a vector graphic the size of a pinhead will

retain the same file size—with no degradation in quality—even when enlarged to fit your entire screen (**Figure 1.1**).

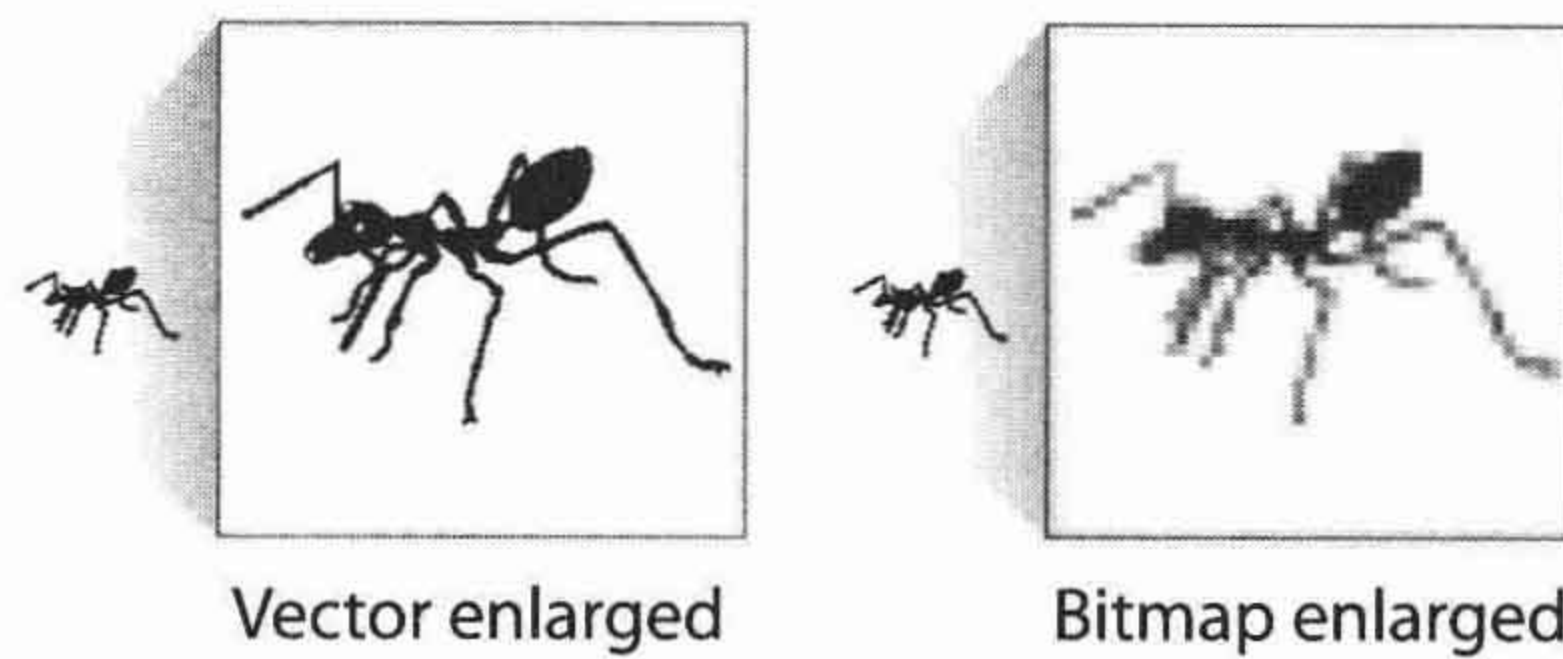


Figure 1.1
Comparison of an enlarged
vector graphic with an enlarged
bitmap graphic.

Traditionally (and on the Web in particular), graphics have been delivered primarily in the form of *bitmaps*. Although effective and often quite artistic, bitmaps are bandwidth intensive and share none of the benefits of vector graphics. Bitmap graphic files, for example, are almost always larger in size than their vector counterparts (even though they appear similar)—a fact that becomes more apparent as the physical dimensions of the graphic increase. The construction of bitmaps accounts for this difference.

Unlike vector images, which use mathematical equations, bitmaps are made up of a collection of dots, or *pixels*, placed in a grid formation, or pattern, one right next to another. These pixels are usually so small that from a distance, the pixels in the pattern that make up a bitmap blend seamlessly to form a picture. However, if you were to zoom in on this picture, the tiny square pixels would become apparent. Each pixel in a bitmap has associated information that relates to its color. Most images comprise thousands, hundreds of thousands, or even millions of pixels. Obviously, the larger the graphic, the more pixels it contains. Hence, even a small bitmap 100 pixels tall by 100 pixels wide would have to store information for 10,000 pixels. You can begin to see the benefits of using vector graphics wherever possible. Although vector graphics offer file size advantages, there are some graphic effects you can achieve only with bitmaps. Fortunately, Flash supports bitmap graphics, even direct import of Macromedia Fireworks 3 or later files. And because it uses the latest compression technologies, Flash helps you keep file size to a minimum even when using bitmaps.

Flash's development approach also facilitates the creation of complex multimedia presentations while still maintaining small file sizes. Because such elements as vectors, bitmaps, and sounds are usually employed more than once in a given movie, Flash allows you to make a single version of an object, which you can then reuse elsewhere rather than re-create the object each time you wish to use it—a capability that goes a long way toward conserving file size. For example, if you wanted to use a 10-KB bitmap graphic in 10 locations in your Flash presentation, it would *appear* to require 100 KB (10 KB used 10 times) of file space. However, Flash requires just one actual

copy of the 10-KB graphic; the other nine instances are simply references to the main file. Although these “references” appear just as the actual file would, less than 100 bytes per instance are required to reference the actual file (**Figure 1.2**). So, you would save nearly 90 KB in file size—a considerable amount on the Web. You can use this powerful capability with vectors, bitmaps, sounds, and more to create compelling yet compact multimedia productions.

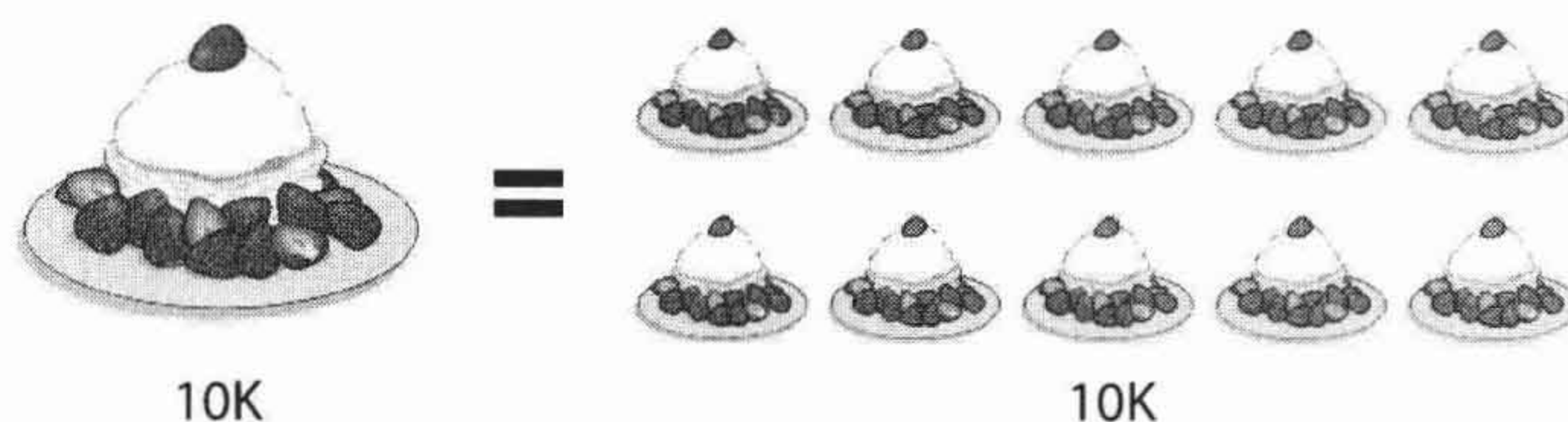


Figure 1.2
A single graphic in Flash can be reused without increasing your movie's overall file size.

A final—and perhaps defining—factor in Flash's ability to create fast-loading multimedia over the Web is its ability to stream content. If it couldn't do this, Flash would probably not be practical for the Web.

Streaming content is another example of a technology born out of necessity on the Web. Before streaming, bandwidth issues prevented users from viewing or listening to files until all of their contents had been downloaded. Engineers, however, realized that users don't see or hear every byte in a file simultaneously: They understood that you could receive the full impact of the content by receiving it incrementally. For example, when reading a book, you view only a page at a time. So, if your book were delivered over the Web, you would probably appreciate being able to read the first few pages while the rest of the book was being downloaded in the background. If you had to wait for the whole book to be downloaded before you could begin reading, you might give up and click elsewhere (**Figure 1.3**).

Flash's streaming capabilities mean that even large files with sound, animation, and bitmaps can begin playing almost instantaneously. If you plan your project precisely, your audience can view a 10- to 15-minute presentation over the Web without noticing that content is being downloaded in the background.

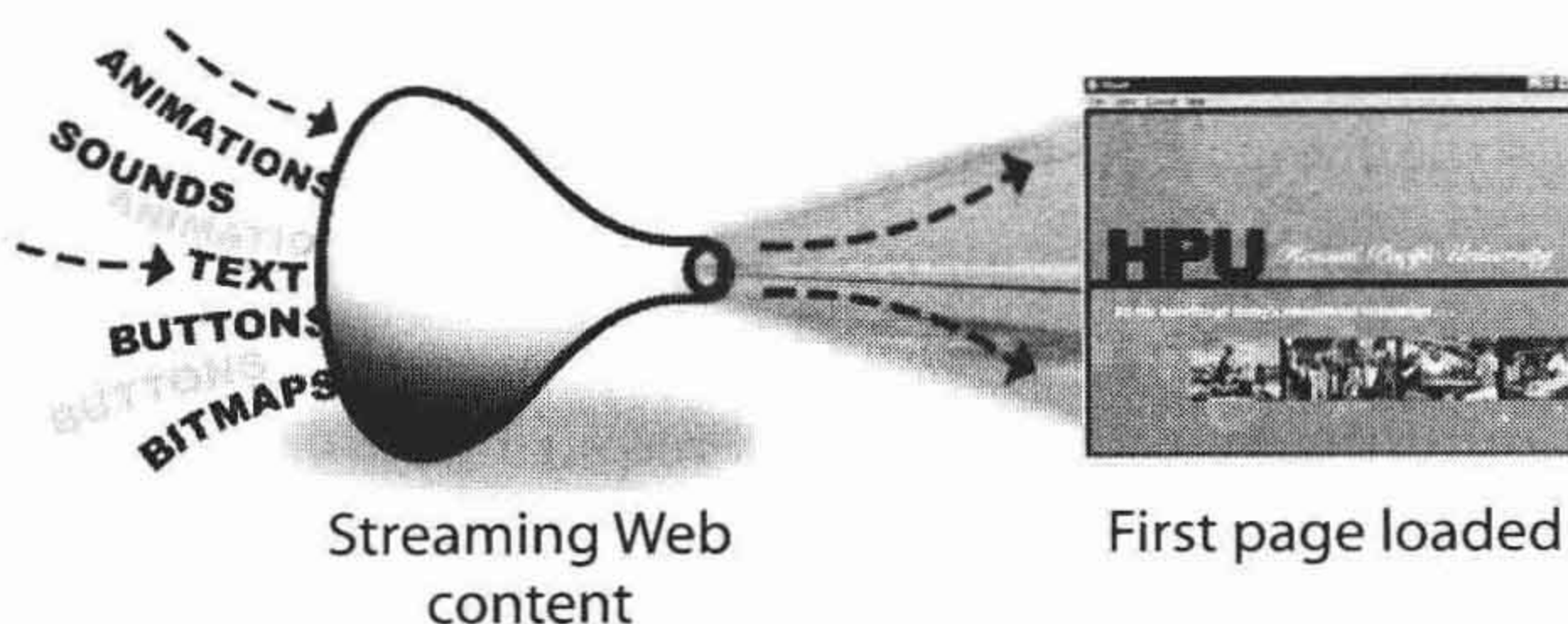


Figure 1.3
Flash allows content to be streamed, which means users can view downloaded sections while other content continues to load.

Web Standard

As most Web developers will attest to, browser and software manufacturers frequently tout Web standards even as they continue to define their own *versions* of those standards. We all have our own ways of doing things, and nowhere is this more apparent than in the browser itself. Take the following scenario: After spending hours creating the perfect Web page, with graphics placed just so and perhaps some JavaScript added for a bit of simple interactivity, you view your work in your favorite browser, where it looks and functions just as it should. You feel pretty good until you decide to view the page through your *least favorite* browser: Now you're mortified. Besides not looking anything like it should, your Web page is producing JavaScript error after JavaScript error. Your beautiful interactive page has fallen victim to a compatibility problem between browsers—one that may well send you back to the drawing board.

Since the Web continues to evolve at a phenomenal rate, the lack of universal standards remains a roadblock to a number of powerful technologies. Many developers are sticking to the basics rather than running the risk of creating compatibility problems by including fancier features—a problem Macromedia addressed by creating the Flash Player, a plug-in that enables the program's content to be viewed consistently across browsers, operating systems, Web-enabled appliances, and even video game consoles (for example, Sega Dreamcast and Sony Play Station).

Now, in addition to proliferating on the Web and in electronic devices, Flash technology is turning up on many major companies' Web sites. In fact, 35 percent of the world's top 50 Web sites make use of the program. And more than 90 percent of the browsers in use today—or nearly 250 million users—are able to view Flash content without having to download the player. (However, rest assured: If you do need to download the plug-in, the process is quick and simple.) What's more, current (and future) versions of the major browsers include the Flash Player, and current versions of Windows and Macintosh operating systems ship with it preinstalled: If these facts doesn't make Flash a standard, we can't imagine what would.

The icing on the cake, though, came after Macromedia made the SWF (Flash movie) format available to the public last year, allowing any software developer to create products that export content in Flash's file format. In response to this action—and in tacit acknowledgement of Flash's market-leading position—Adobe has included support for the Flash format in its own Web content development product, LiveMotion: Instead of creating a proprietary multimedia tool that would require its own plug-in, Adobe is offering a product that can export the content it creates to the Flash format—great news for developers, who now have a choice of authoring tools (although LiveMotion's interactive capabilities do not compare to Flash 5's). What's more, a