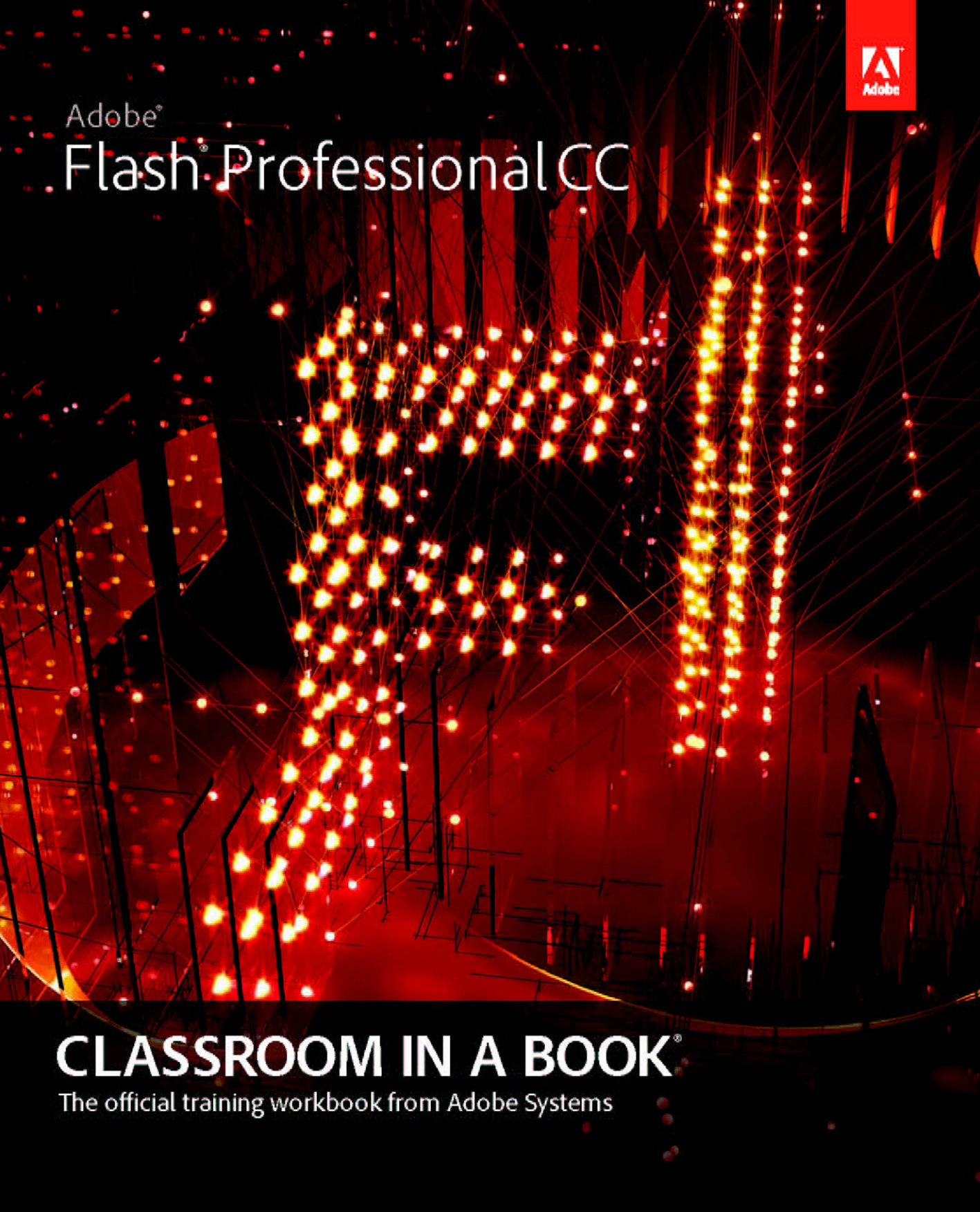
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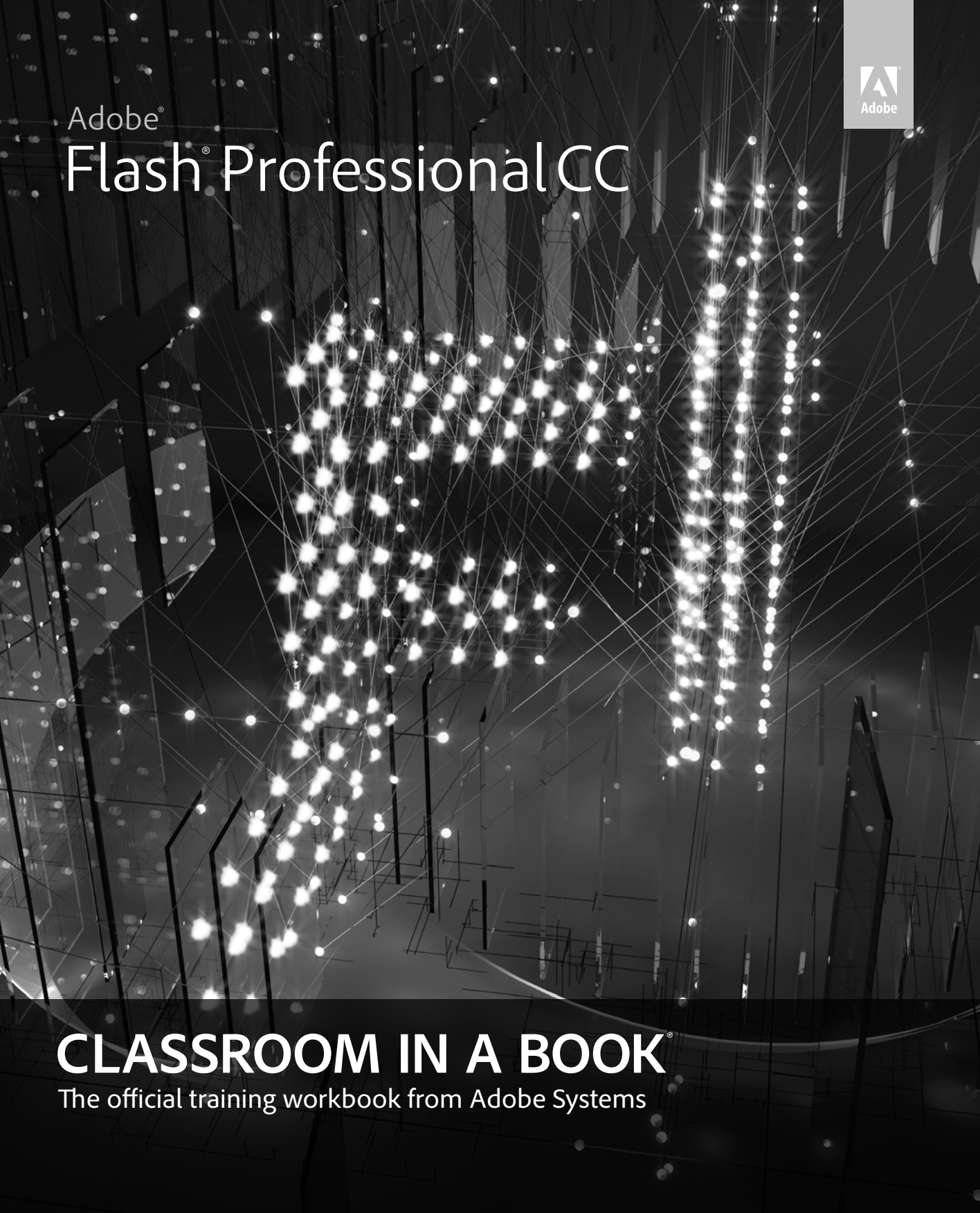
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GETTING STARTED

Adobe Flash Professional CC provides a comprehensive authoring environment for creating interactive and media-rich applications. Flash is widely used to create engaging projects integrating video, sound, graphics, and animation. You can create original content in Flash or import assets from other Adobe applications such as Photoshop or Illustrator, quickly design animation and multimedia, and use Adobe ActionScript 3.0 to integrate sophisticated interactivity.

Use Flash Professional to build innovative and immersive Web sites, to create standalone applications for the desktop, or to create apps to distribute to mobile devices running on the Android or the iOS system.

With extensive controls for animation, intuitive and flexible drawing tools, and a powerful, object-oriented coding language, Flash delivers one of the few robust authoring environments that let your imagination become reality.

About Classroom in a Book

Adobe Flash Professional CC Classroom in a Book is part of the official training series for Adobe graphics and publishing software developed with the support of Adobe product experts. The lessons are designed so you can learn at your own pace. If you're new to Flash, you'll learn the fundamental concepts and features you'll need to use the program. Classroom in a Book also teaches many advanced features, including tips and techniques for using the latest version of this application.

What's New

The lessons in this book provide opportunities to use some of the updated features and improvements in Flash Professional, including:

- A fresh, modern user interface
- Working in full-screen mode
- Distributing symbols and bitmaps to keyframes
- Swapping multiple symbols or bitmaps
- A powerful Find and Replace panel
- Improved Photoshop and Illustrator file import
- A re-engineered Actions panel
- Smoother, more responsive drawing and editing
- Exporting videos with Adobe Media Encoder
- Resizing the Stage relative to an anchor point
- An integrated Toolkit for CreateJS, which publishes animation to HTML5 and JavaScript
- Comprehensive testing tools, such as device testing via USB and SWF analysis with Adobe Scout
- Synchronizing preferences on multiple machines with Creative Cloud

Streamlined Feature Set

In order to provide a more focused creative environment, Adobe Flash Professional CC has streamlined its feature set. The following is a list of the notable tools that have been dropped from the previous version:

- Support for ActionScript 1 and 2
- TLF text
- Motion Editor for motion tweens
- Bone tool for inverse kinematics
- Deco tool
- Project panel
- Printing
- Strings panel

- Behaviors panel
- Object-level undo
- Spelling panel
- Movie Explorer
- Bandwidth profiler in Test Movie mode
- FXG file import or export
- Kuler panel
- Video Cue Points (but still available in Media Encoder and through ActionScript)
- Closed captioning
- Video playback on Stage with FLV playback component
- Device Central
- Importing SWFs
- Pick whip in the Code Snippets panel
- Auto-Save
- File Info (XMP Metadata)
- Import support for some bitmap formats (BMP, TIFF, AutoCad) and some sound formats (AIFF, Sound Designer, Around AU, Adobe Sounds Document)
- Publishing projectors

Prerequisites

Before you begin using *Adobe Flash Professional CC Classroom in a Book*, make sure your system is set up correctly and that you've installed the required software. You should have a working knowledge of your computer and operating system. You should know how to use the mouse and standard menus and commands, and also how to open, save, and close files. If you need to review these techniques, see the printed or online documentation included with your Microsoft Windows or Apple Mac OS software.

If you're working on Microsoft Windows, you need to download Apple's QuickTime software, free from http://www.apple.com/quicktime/download/ in order to work with the videos in Lesson 7.

In addition, you need to download the free Adobe AIR runtime, available at http://get.adobe.com/air/ to publish desktop applications in Lesson 11.

Installing Flash

You must purchase the Adobe Flash Professional application as part of the Adobe Creative Cloud. The following specifications are the minimum required system configurations.

Windows

- Intel® Pentium 4, Intel Centrino®, Intel Xeon®, or Intel Core™ Duo (or compatible) processor
- Microsoft® Windows® 7 64-bit and Microsoft® Windows® 8 64-bit
- 2GB of RAM (4GB recommended)
- 1024x768 display (1280x800 recommended)
- Java Runtime Environment 1.7 (included)
- QuickTime 10.x software recommended
- 2GB of available hard-disk space for installation; additional free space required during installation (cannot install on removable flash storage devices)
- Broadband Internet connection and registration are necessary for required software activation, validation of subscriptions, and access to online services.

Mac OS

- Multicore Intel® processor
- Mac OS X v10.7 64-bit and 10.8 64-bit
- 2GB of RAM (4GB recommended)
- 1024x768 display (1280x800 recommended)
- Java™ Runtime Environment 1.7
- QuickTime 10.x software recommended
- 2.5GB of available hard-disk space for installation; additional free space required during installation (cannot install on a volume that uses a case-sensitive file system or on removable flash storage devices)
- Broadband internet connection and registration are necessary for required software activation, validation of subscriptions, and access to online services.

For updates on system requirements and complete instructions on installing the software, visit http://www.adobe.com/products/flash/tech-specs.html.

Install Flash from the Adobe Creative Cloud at https://creative.adobe.com/ and make sure that you have your login and password accessible.

Copying the Lesson Files

The lessons in *Adobe Flash Professional CC Classroom in a Book* use specific source files, such as image files created in Adobe Illustrator, video files created in Adobe After Effects, audio files, and prepared Flash documents. To access the Classroom in a Book files:

1. On a Mac or PC, go to www.peachpit.com/redeem and enter the code found at the back of your book.
2. If you do not have a Peachpit.com account, you will be prompted to create one.
3. The downloadable files will be listed under Lesson & Update Files tab on your Account page.
4. Click the lesson file links to download them to your computer.
5. On your hard drive, create a new folder in a convenient location and name it **FlashProCC,** following the standard procedure for your operating system:
   - If you're running Windows, right-click and choose New > Folder. Then enter the new name for your folder.
   - If you're using Mac OS, in the Finder, choose File > New Folder. Type the new name and drag the folder to the location you want to use.

   Now you can download the lesson files onto your hard drive.
6. Drag the Lessons folder (which contains folders named Lesson01, Lesson02, and so on) that you downloaded onto your hard drive to your new FlashProCC folder.

When you begin each lesson, navigate to the folder with that lesson number to access all the assets, sample movies, and other project files you need to complete the lesson.

If you have limited storage space on your computer, you can copy each lesson folder as you need it, and then delete it after you've completed the lesson if desired. Some lessons build on preceding lessons; in those cases, a starting project file is provided for you for the second lesson or project. You do not have to save any finished project if you don't want to or if you have limited hard drive space.

Copying the sample movies and projects

You will create and publish SWF animation files in some lessons in this book. The files in the End folders (01End, 02End, and so on) within the Lesson folders are samples of completed projects for each lesson. Use these files for reference if you want to compare your work in progress with the project files used to generate the sample movies. The end project files vary in size from relatively small to a couple of megabytes, so you can either copy them all now if you have ample storage space or copy just the end project file for each lesson as needed. Then you can delete it when you finish that lesson.

How to Use the Lessons

Each lesson in this book provides step-by-step instructions for creating one or more specific elements of a real-world project. Some lessons build on projects created in preceding lessons; most stand alone. All the lessons build on one another in terms of concepts and skills, so the best way to learn from this book is to proceed through the lessons in sequential order. In this book, some techniques and processes are explained and described in detail only the first few times you perform them.

The organization of the lessons is also project-oriented rather than feature-oriented. That means, for example, that you'll work with symbols on real-world design projects over several lessons rather than in just one chapter.

Additional Resources

Adobe Flash Professional CC Classroom in a Book is not meant to replace documentation that comes with the program or to be a comprehensive reference for every feature. Only the commands and options used in the lessons are explained in this book. For comprehensive information about program features and tutorials, refer to these resources:

Adobe Flash Professional CC Help and Support: www.adobe.com/support/flash is where you can find and browse Help and Support content on Adobe.com. Adobe Flash Professional Help and Adobe Flash Professional Support Center are accessible from Flash Professional's Help menu.

Adobe Creative Cloud Learning: For inspiration, key techniques, cross-product workflows, and updates on new features, go to the Creative Cloud Learn page https://helpx.adobe.com/creative-cloud/tutorials.html. Available only to Creative Cloud members.

Adobe Forums: forums.adobe.com lets you tap into peer-to-peer discussions, questions, and answers on Adobe products. The Flash Professional forum is accessible from Flash Professional's Help menu.

Adobe TV: tv.adobe.com is an online video resource for expert instruction and inspiration about Adobe products, including a How To channel to get you started with your product.

Adobe Design Center: www.adobe.com/designcenter offers thoughtful articles on design and design issues, a gallery showcasing the work of top-notch designers, tutorials, and more.

Resources for educators: www.adobe.com/education and http://edex.adobe.com offer a treasure trove of information for instructors who teach classes on Adobe software. Find solutions for education at all levels, including free curricula that use an integrated approach to teaching Adobe software and can be used to prepare for the Adobe Certified Associate exams.

Also check out these useful links:

Adobe Marketplace & Exchange: www.adobe.com/cfusion/exchange is a central resource for finding tools, services, extensions, code samples, and more to supplement and extend your Adobe products.

Adobe Flash Professional CC product home page: www.adobe.com/products/flash

Adobe Labs: labs.adobe.com gives you access to early builds of cutting-edge technology, as well as forums where you can interact with both the Adobe development teams building that technology and other like-minded members of the community.

Adobe Certification

The Adobe training and certification programs are designed to help Adobe customers improve and promote their product-proficiency skills. There are four levels of certification:

- Adobe Certified Associate (ACA)
- Adobe Certified Expert (ACE)
- Adobe Certified Instructor (ACI)
- Adobe Authorized Training Center (AATC)

The Adobe Certified Associate (ACA) credential certifies that individuals have the entry-level skills to plan, design, build, and maintain effective communications using different forms of digital media.

The Adobe Certified Expert program is a way for expert users to upgrade their credentials. You can use Adobe certification as a catalyst for getting a raise, finding a job, or promoting your expertise.

If you are an ACE-level instructor, the Adobe Certified Instructor program takes your skills to the next level and gives you access to a wide range of Adobe resources.

Adobe Authorized Training Centers offer instructor-led courses and training on Adobe products, employing only Adobe Certified Instructors. A directory of AATCs is available at partners.adobe.com.

For information on the Adobe Certified programs, visit www.adobe.com/support/certification/main.html.

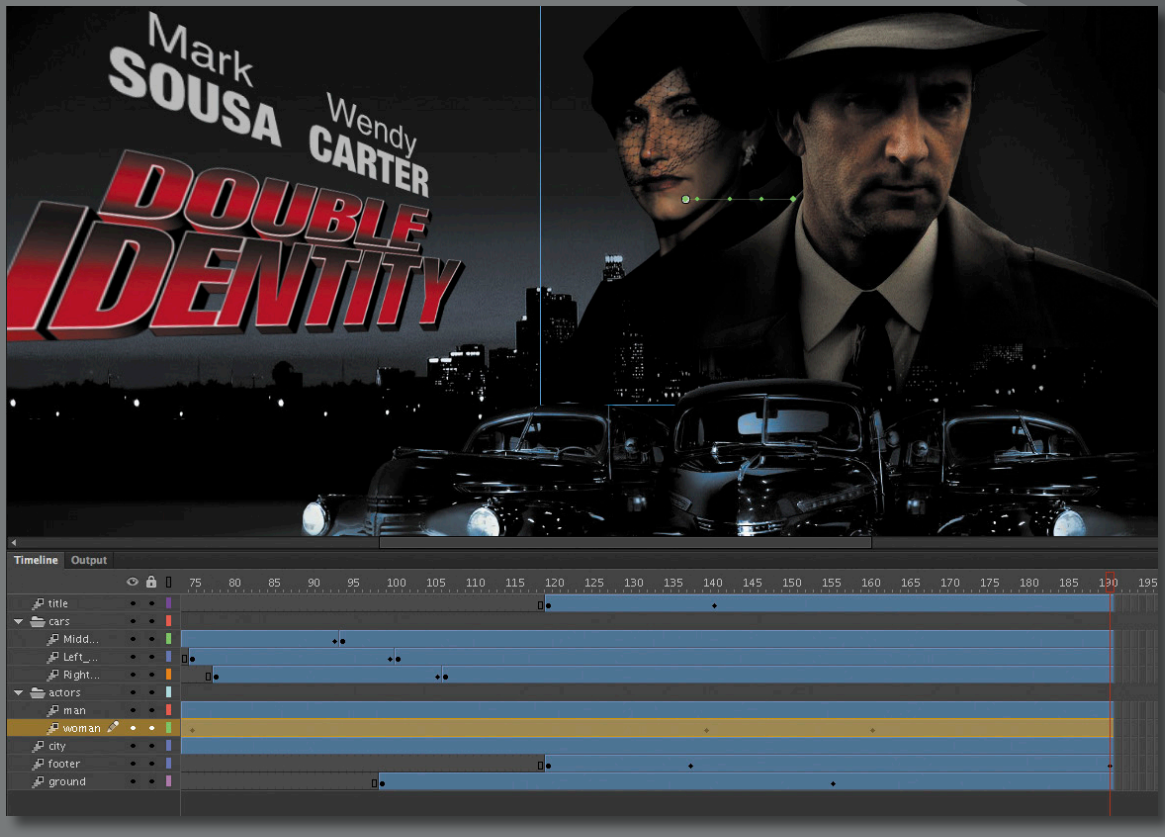
4 ANIMATING SYMBOLS

Lesson Overview

In this lesson, you'll learn how to do the following:

- Animate the position, scale, and rotation of objects
- Adjust the pacing and timing of your animation
- Animate transparency and special effects
- Change the path of an object's motion
- Create animation inside symbols
- Split a motion tween
- Change the easing of an object's motion
- Animate in 3D space

This lesson will take approximately 2 hours to complete. If needed, remove the previous lesson folder from your hard drive and copy the Lesson04 folder onto it. Download the project files for this lesson from the Lesson & Update Files tab on your Account page at www.peachpit.com and store them on your computer in a convenient location, as described in the Getting Started section of this book. Your Accounts page is also where you'll find any updates to the chapters or to the lesson files. Look on the Lesson & Update Files tab to access the most current content.



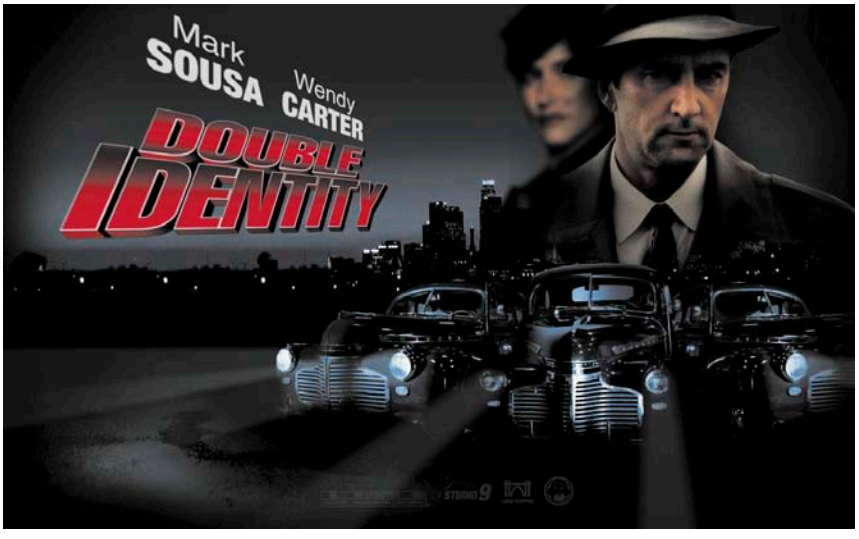
Use Flash Professional to change almost any aspect of an object—position, color, transparency, size, rotation, and more—over time. Motion tweening is the basic technique of creating animation with symbol instances.

Getting Started

Note: If you have not already downloaded the project files for this lesson to your computer from your Account page, make sure to do so now. See "Getting Started" at the beginning of the book.

Start by viewing the finished movie file to see the animated title page that you'll create in this lesson.

1 Double-click the 04End.html file in the Lesson04/04End folder to play the animation in a browser.



The project is an animated splash page for an imaginary soon-to-be-released motion picture. In this lesson, you'll use motion tweens to animate several components on the page: the cityscape, the main actors, several old-fashioned cars, and the main title.

2 Close the 04End.html file.

3 Double-click the 04Start.fla file in the Lesson04/04Start folder to open the initial project file in Flash. This file is partially completed and already contains many of the graphic elements imported into the Library for you to use.

4 From the view options above the Stage, choose Fit in Window, or View > Magnification > Fit in Window so that you can see the entire Stage on your computer screen.

5 Choose File > Save As. Name the file **04_workingcopy.fla**, and save it in the 04Start folder.

Saving a working copy ensures that the original start file will be available if you want to start over.

About Animation

Animation is the movement, or change, of objects through time. Animation can be as simple as moving a box across the Stage from one frame to the next. It can also be much more complex. As you'll see in this lesson, you can animate many different aspects of a single object. You can change an object's position on the Stage, change its color or transparency, change its size or its rotation, and even animate the special filters that you saw in the previous lesson. You also have control over an object's path of motion, and even its easing, which is the way an object accelerates or decelerates.

In Flash, the basic workflow for animation goes like this: Select an object on the Stage, right-click/Ctrl-click, and choose Create Motion Tween. Move the red playhead to a different point in time and move the object to a new position or change one of its properties. Flash takes care of the rest.

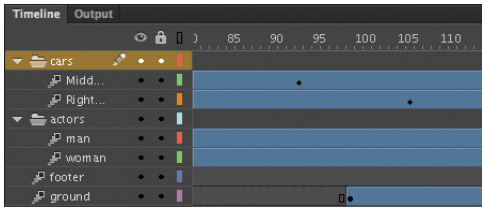
Motion tweens create animation for changes in position on the Stage and for changes in size, color, or other attributes. Motion tweens require you to use a symbol instance. If the object you've selected is not a symbol instance, Flash will automatically ask to convert the selection to a symbol.

Flash also automatically separates motion tweens on their own layers, which are called Tween layers. There can be only one motion tween per layer without any other element in the layer. Tween layers allow you to change various attributes of your instance at different key points over time. For example, a spaceship could be on the left side of the Stage at the beginning keyframe and at the far-right side of the Stage at an ending keyframe, and the resulting tween would make the spaceship fly across the Stage.

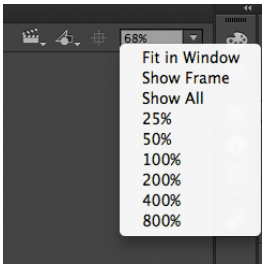
The term "tween" comes from the world of classic animation. Senior animators would be responsible for drawing the beginning and ending poses for their characters. The beginning and ending poses were the keyframes of the animation. Junior animators would then come in and draw the "in-between" frames, or do the "in-betweening." Hence, "tweening" refers to the smooth transitions between keyframes.

Understanding the Project File

The 04Start.fla file contains a few of the animated elements already or partially completed. Each of the six layers—man, woman, Middle_car, Right_car, footer, and ground—contains an animation. The man and woman layers are in a folder called actors, and the Middle_car and Right_car layers are in a folder called cars.

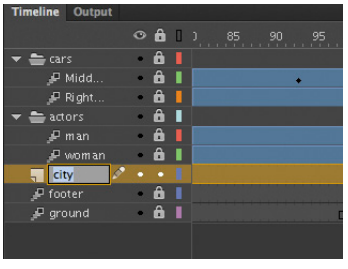


You'll be adding more layers to add an animated cityscape, refining the animation of one of the actors, as well as adding a third car and a 3D title. All the necessary graphic elements have been imported into the Library panel. The Stage is set at a generous 1280 pixels by 787 pixels, and the Stage color is black. You might need to choose a different view option to see the entire Stage. Choose View > Magnification > Fit in Window, or choose Fit in Window from the view options at the top-right corner of the Stage to view the Stage at a magnification percentage that fits your screen.

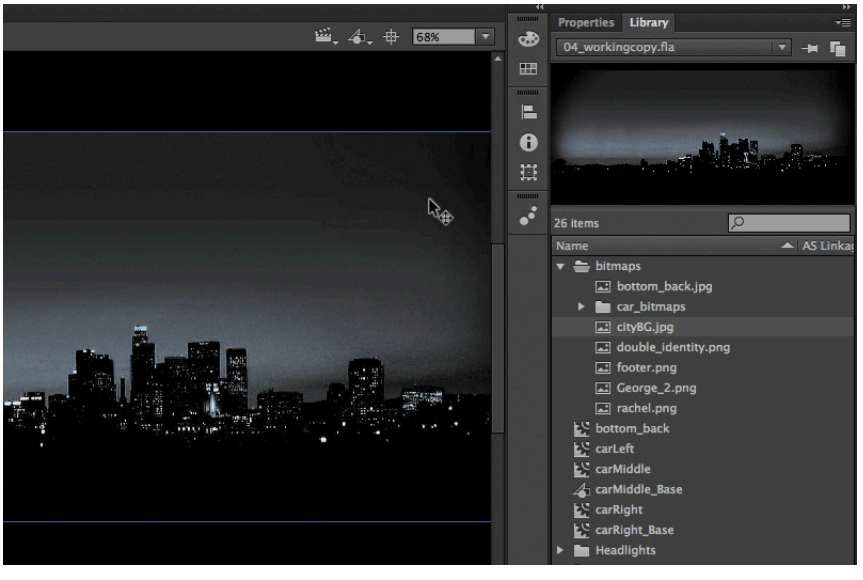


Animating Position

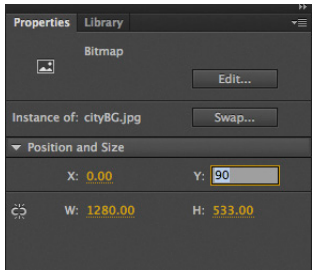
You'll start this project by animating the cityscape. It will begin slightly lower than the top edge of the Stage, and then rise slowly until its top is aligned with the top of the Stage.



1. Lock all the existing layers so you don't accidentally modify them. Create a new layer above the footer layer and rename it **city**.
2. Drag the bitmap image called cityBG.jpg from the bitmaps folder in the Library panel to the Stage.

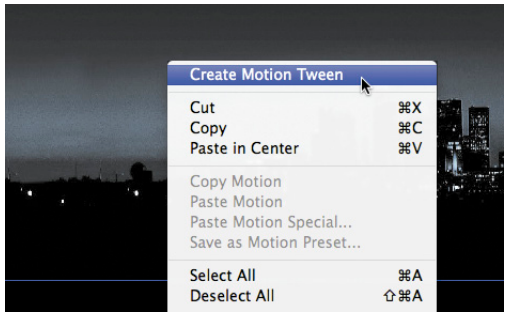


3 In the Properties inspector, set the value of X to **0** and the value of Y to **90**.

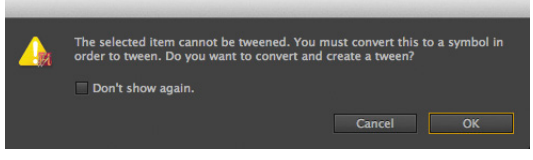


This positions the cityscape image just slightly below the top edge of the Stage.

4 Right-click/Ctrl-click on the cityscape image and choose Create Motion Tween. From the top menu, you can also select Insert > Motion Tween.



5 A dialog box appears warning you that your selected object is not a symbol. Motion tweens require symbols. Flash asks if you want to convert the selection to a symbol so it can proceed with the motion tween. Click OK.



Flash automatically converts your selection to a symbol, which is stored in your Library panel. Flash also converts the current layer to a Tween layer so you can begin to animate the instance. Tween layers are distinguished by a special icon in front of the layer name, and the frames are tinted blue. Tween layers are reserved for motion tweens, and hence, no drawing is allowed on a Tween layer.

6 Move the red playhead to the end of the tween span at frame 190.

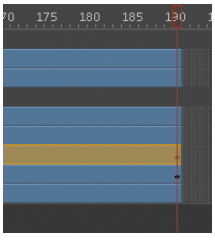
7 Select the instance of the cityscape on the Stage, and while holding down the Shift key, move the instance up the Stage.

Holding down the Shift key constrains the movement to right angles.

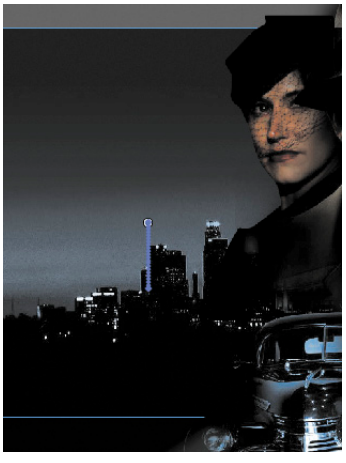
● **Note:** Hide all the other layers to isolate the cityscape and to better see the results of the motion tween.

8 For more precision, set the value of Y to **0** in the Properties inspector.

A small black diamond appears in frame 190 at the end of the tween span. This indicates a keyframe at the end of the tween.



Flash smoothly interpolates the change in position from frame 1 to frame 190 and represents that motion with a motion path.



● **Note:** Remove a motion tween by right-clicking/Ctrl-clicking the motion tween on the Timeline or the Stage and choosing Remove Tween.

9 Drag the red playhead back and forth at the top of the Timeline to see the smooth motion. You can also choose Control > Play (Enter) to make Flash play the animation.

Animating changes in position is simple, because Flash automatically creates keyframes at the points where you move your instance to new positions. If you want to have an object move to many different points, simply move the red playhead to the desired frame, and then move the object to its new position. Flash takes care of the rest.

Using the Controller to preview the animation

The Controller panel allows you to play, rewind, or go step-by-step backward or forward through your Timeline to review your animation in a controlled manner.

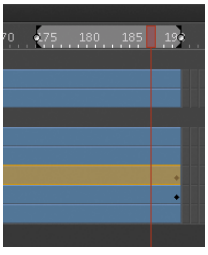
Use the playback controls that are integrated at the bottom of the Timeline, or choose the playback commands from the Control menu.

1 Click any of the playback buttons on the controller below the Timeline to go to the first frame, go to the last frame, play, stop, or move forward or backward one frame.

2 Choose the loop option at the bottom of the Timeline and click the play button.

The playhead loops, allowing you to see the animation over and over for careful analysis.

3 Move the front or rear brackets on the Timeline to define the range of frames that you want to see looped.



The playhead loops within the bracketed frames. Click on the loop option again to turn it off.

Changing the Pacing and Timing

You can change the duration of the entire tween span or change the timing of the animation by clicking and dragging keyframes on the Timeline.

Changing the animation duration

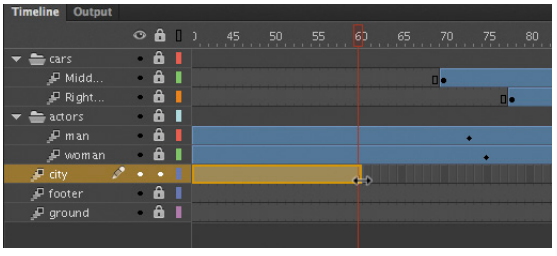
If you want the animation to proceed at a slower pace (and hence, taking up a much longer period of time), you need to lengthen the entire tween span between the beginning and end keyframes. If you want to shorten the animation, you need to decrease the tween span. Lengthen or shorten a motion tween by dragging the ends on the Timeline.

1 Move your mouse cursor close to the end of the tween span in the city layer.

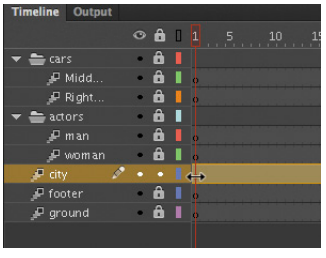
Your cursor changes to a double-headed arrow, indicating that you can lengthen or shorten the tween span.

2 Click and drag the end of the tween span back toward frame 60.

Your motion tween shortens to 60 frames, so now the cityscape takes a much shorter time to move.



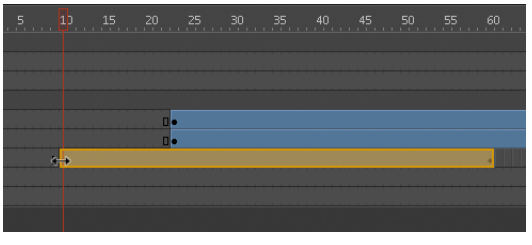
3 Move your mouse cursor close to the beginning of the tween span (at frame 1).



Note: If you have multiple keyframes in a tween, dragging out your tween spans will distribute all your keyframes uniformly. The timing of your entire animation remains the same; only the length changes.

4 Click and drag the beginning of the frame span forward to frame 10.

Your motion tween begins at an earlier time, so it now plays only from frame 10 to frame 60.

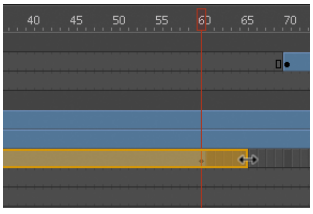


Adding frames

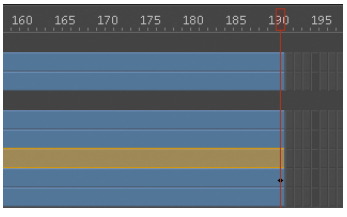
You'll want the last keyframe of your motion tween to hold for the remainder of the animation. Add frames by Shift-dragging the end of a tween span.

1 Move your mouse cursor close to the end of the tween span.

2 Hold down the Shift key, and click and drag the end of the tween span forward to frame 190.



The last keyframe in the motion tween remains at frame 60, but additional frames are added to frame 190.



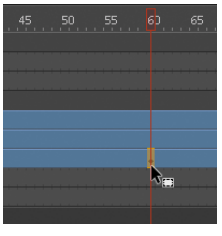
Note: You can also add individual frames by choosing Insert > Timeline > Frame (F5), or remove individual frames by choosing Edit > Timeline > Remove Frames (Shift+F5).

Moving keyframes

If you want to change the pacing of an animation, you can select individual keyframes, then click and drag the keyframes to new positions.

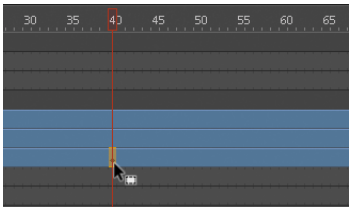
1 Click on the keyframe at frame 60.

The keyframe at frame 60 is selected. A tiny box appears next to your mouse cursor indicating that you can move the keyframe.



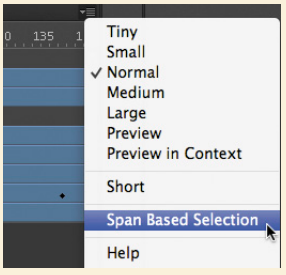
2 Click and drag the keyframe to frame 40.

The last keyframe in the motion tween moves to frame 40, so the motion of the cityscape proceeds quicker.



Span-Based vs. Frame-Based Selections

By default, Flash does not use span-based selection, which means you can select individual keyframes within a motion tween. However, if you prefer to click on a motion tween and have the entire span (the beginning and end keyframes, and all the frames in between) be selected, you can enable Span Based Selection from the Options menu on the top-right corner of the Timeline.



With Span Based Selection enabled, you can click anywhere within the motion tween to select it, and move the whole animation backward or forward along the Timeline as a single unit.

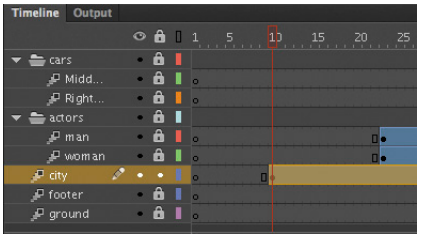
If you want to select individual keyframes while Span Based Selection is enabled, hold down the Ctrl (Windows)/Command (Mac OS) key and click on a keyframe.

Animating Transparency

In the previous lesson, you learned how to change the color effect of any symbol instance to change the transparency, tint, or brightness. You can change the color effect of an instance in one keyframe and change the value of the color effect in another keyframe, and Flash will automatically display a smooth change, just as it does with changes in position.

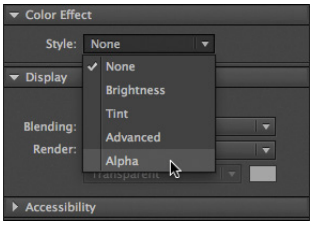
You'll change the cityscape in the beginning keyframe to be totally transparent but keep the cityscape in the ending keyframe opaque. Flash will create a smooth fade-in effect.

1 Move the red playhead to the first keyframe of the motion tween (frame 10).

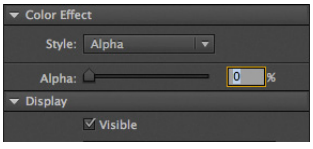


2 Select the cityscape instance on the Stage.

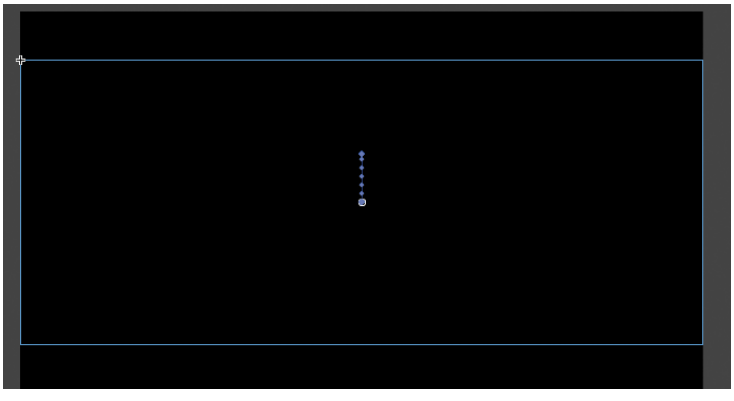
3 In the Properties inspector, choose the Alpha option for Color Effect.



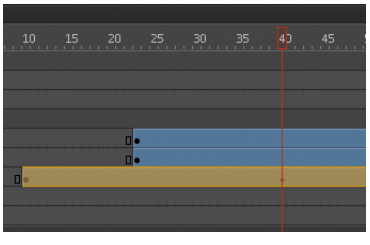
4 Set the Alpha value to **0**%.



The cityscape instance on the Stage becomes totally transparent.

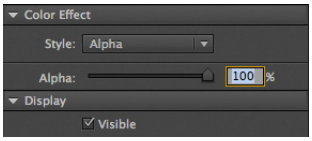


5 Move the red playhead to the last keyframe of the motion tween (frame 40).

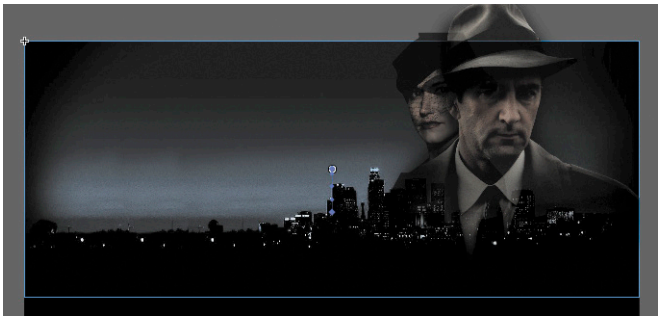


6 Select the cityscape instance on the Stage.

7 In the Properties inspector, under Color Effect, set the Alpha value to **100**%.



The cityscape instance on the Stage becomes totally opaque.



8 Preview the effect by choosing Control > Play (Enter).

Flash interpolates the changes in both position and transparency between the two keyframes.

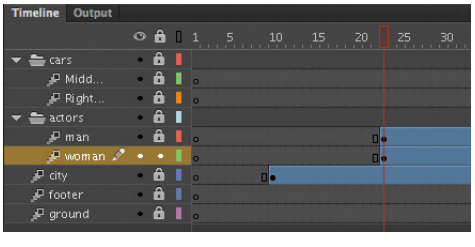
Animating Filters

Filters, which give instances special effects such as blurs and drop shadows, can also be animated. You'll refine the motion tween of the actors next by applying a blur filter to one of them to make it appear as if the camera changes focus. Animating filters is no different from animating changes in position or changes in color effect. You simply set the values for a filter at one keyframe and set different values for the filter at another keyframe, and Flash creates a smooth transition.

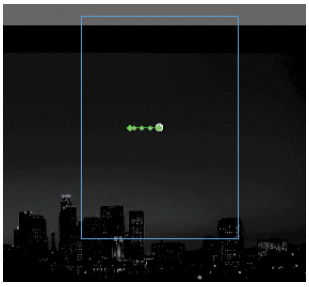
1 Make the actors layer folder on the Timeline visible.

2 Lock all the layers on the Timeline except the woman layer.

3 Move the red playhead to the beginning keyframe of the motion tween in the woman layer—at frame 23.



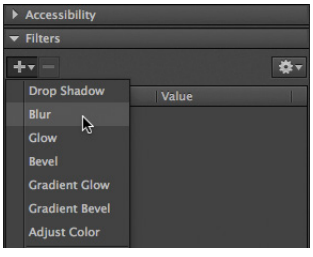
4 Select the instance of the woman on the Stage. You won't be able to see her because she has an alpha value of 0% (totally transparent), but if you click on the top-right side of the Stage, the transparent instance will be selected.



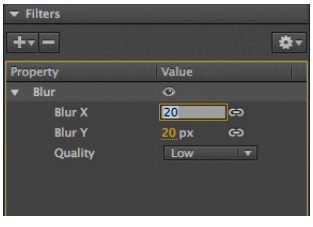
5 In the Properties inspector, expand the Filters section.

6 Click the Add filter button at the top of the Filters section and select Blur.

Flash applies the Blur filter to the instance.



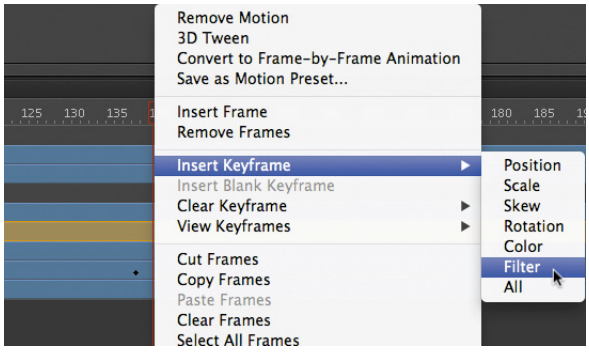
7 In the Filters section of the Properties inspector, make sure that the link icons are intact to constrain the blur values to both the *x* and *y* directions equally. Set the X and Y Blur values to **20** pixels.



8 Move the red playhead across the entire Timeline to preview the animation.

The 20-pixel Blur filter is applied to the woman instance throughout the motion tween.

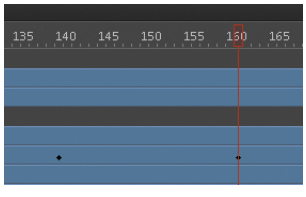
9 Right-click/Ctrl-click on the woman layer at frame 140, and choose Insert Keyframe > Filter.



A keyframe for filters is established at frame 140.

10 Move the red playhead to frame 160, and right-click/Ctrl-click on the woman layer and choose Insert Keyframe > Filter.

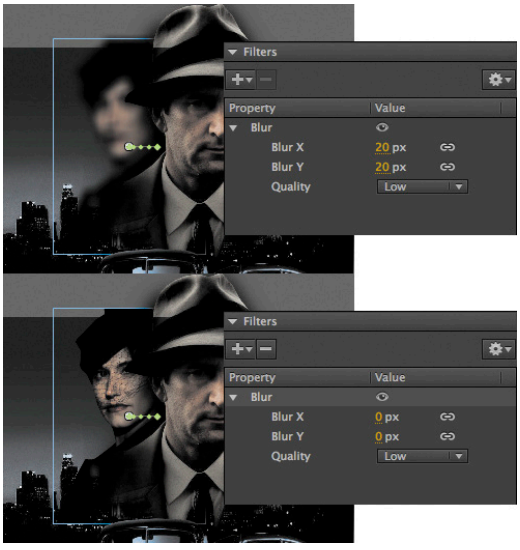
Another keyframe for filters is established at frame 160.



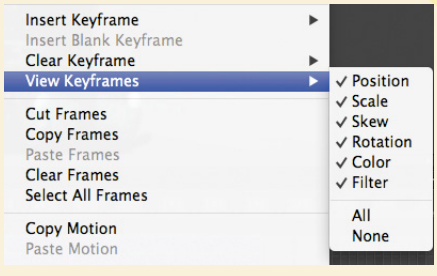
11 Select the instance of the woman on the Stage at frame 160.

12 In the Properties inspector, change the value of the Blur filter to X=**0** and Y=**0**.

The Blur filter changes from the keyframe at frame 140 to the keyframe at 160. Flash creates a smooth transition from a blurry instance to an in-focus instance.



Understanding Property Keyframes



Changes in properties are independent of one another and do not need to be tied to the same keyframes. That is, you can have a keyframe for position, a different keyframe for the color effect, and yet another keyframe for a filter. Managing many different kinds of keyframes can become overwhelming, especially if you want different properties to change at different times during the motion tween. Fortunately, Flash Professional provides a few helpful tools for keyframe management.

When viewing the tween span, you can choose to view the keyframes of only certain properties. For example, you can choose to view only the Position keyframes to see when your object moves. Or, you can choose to view only the Filter keyframes to see when there is a filter change. Right-click/Ctrl-click on a motion tween in the Timeline, choose View Keyframes, and then select the desired property among the list. You can also choose All or None to see all the properties or none of the properties.

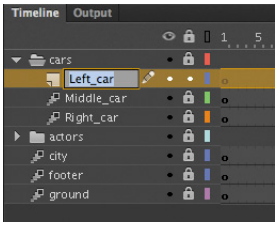
When inserting a keyframe, you can also insert a keyframe specific to the property you want to change. Right-click/Ctrl-click on a motion tween in the Timeline, choose Insert Keyframes, and then select the desired property.

Animating Transformations

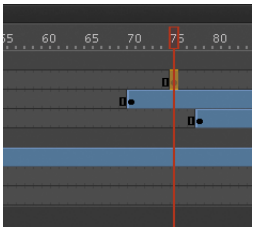
Now you'll learn how to animate changes in scale or rotation. These kinds of changes are made with the Free Transform tool or with the Transform panel. You'll add a third car to the project. The car will start small, and then become larger as it appears to move forward toward the viewer.

1 Lock all the layers on the Timeline.

2 Insert a new layer inside the Cars folder and rename it **Left_car**.



3 Select frame 75 and insert a new keyframe (F6).



4 Drag the movie clip symbol called carLeft from the Library panel to the Stage at frame 75.

5 Select the Free Transform tool.

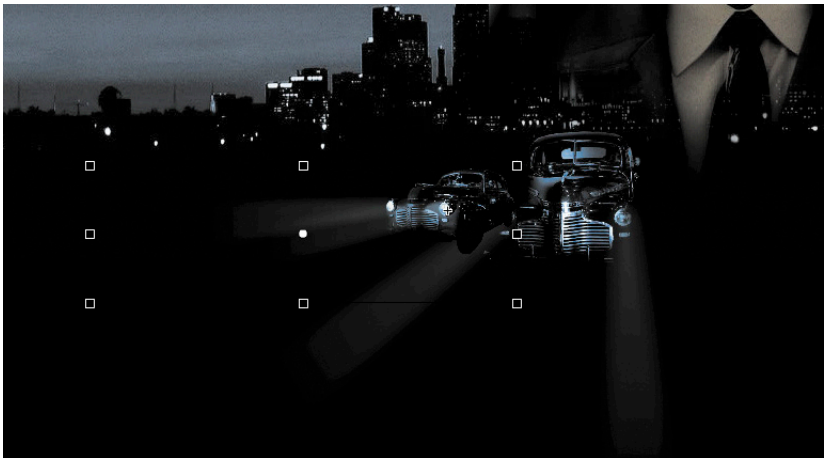
The transformation handles appear around the instance on the Stage.

6 While holding down the Shift key, click and drag a corner handle inward to make the car smaller.

7 In the Properties inspector, make sure that the width of the car is about 400 pixels.

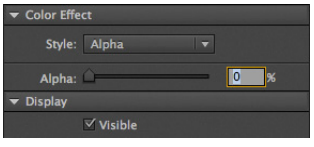
8 Alternatively, you can use the Transform panel (Window > Transform) and change the scale of the car to about **29.4**%.

9 Move the car to its starting position at about X=710 and Y=488.



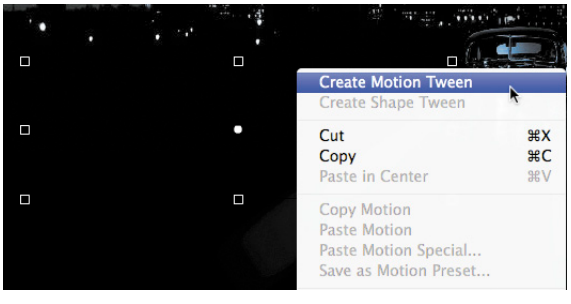
10 In the Properties inspector, select Alpha for the Color Effect.

11 Set the value of the Alpha to **0**%.



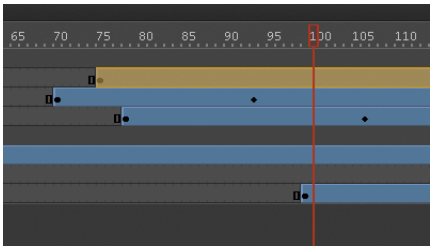
The car becomes totally transparent.

12 Right-click/Ctrl-click on the car on the Stage and select Create Motion Tween.

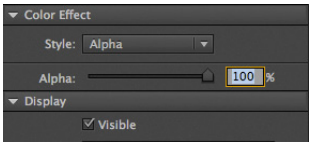


The current layer becomes a Tween layer.

13 Move the red playhead on the Timeline to frame 100.



14 Select the transparent instance of the car on the Stage, and in the Properties inspector, change the Alpha value to **100**%.



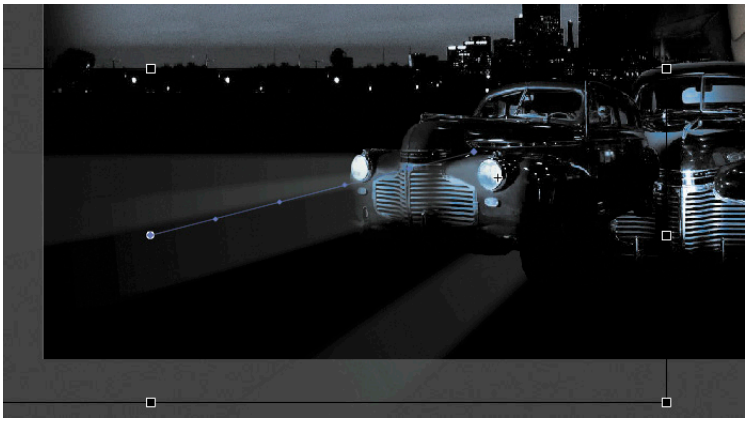
A new keyframe is automatically inserted at frame 100 to indicate the change in transparency.

15 Select the Free Transform tool.

16 While holding down the Shift key, click and drag a corner handle outward to make the car larger. For more precision, use the Properties inspector and set the dimensions of the car to width=**1380** pixels and height=**445.05** pixels.

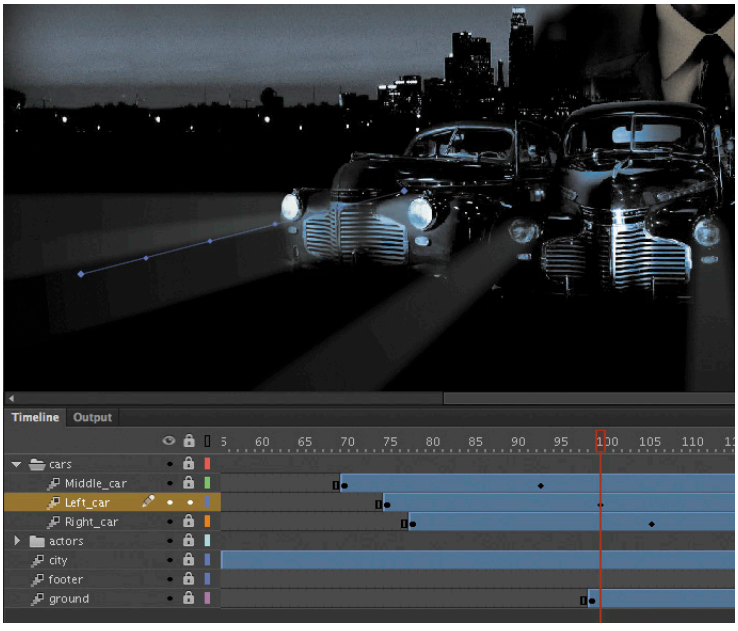
Note: Hold down the Alt (Windows)/ Option (Mac OS) key while you drag the corner handle of the Transformation tool to change the scale relative to the opposite corner point.

17 Position the car at X=**607** and Y=**545**.



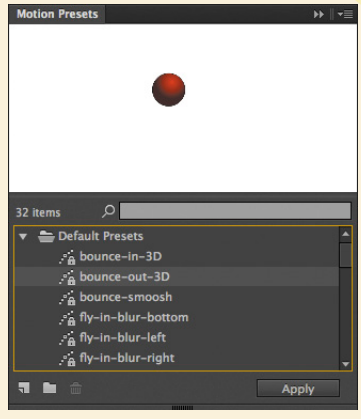
18 Move the Left_car layer in between the Middle_car and Right_car layers so that the car in the center overlaps the cars on the side.

Flash tweens the change in position and the change in scale from frame 75 to frame 100. Flash also tweens the change in transparency from frame 75 to frame 100.



Motion Presets

If your project involves creating identical motion tweens repeatedly, Flash provides a panel called Motion Presets that can help. The Motion Presets panel (Window > Motion Presets) can store any motion tween so you can apply it to different instances on the Stage.

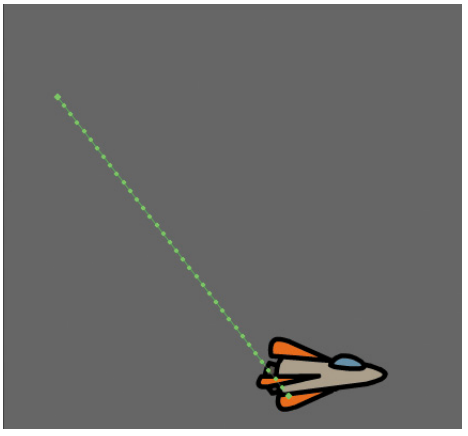


For example, if you want to build a slide show where each image fades out in the same manner, you can save that transition to the Motion Presets panel.

1. Select the first motion tween on the Timeline or the instance on the Stage.
2. In the Motion Presets panel, click the Save selection as preset button at the bottom of the panel.
3. Name your motion preset, and it will be saved in the Motion Presets panel.
4. Select a new instance on the Stage and choose the motion preset.
5. Click Apply, and Flash will apply your saved motion preset to the new instance.

Flash provides a number of motion presets that you can use to quickly build sophisticated animations without much effort.

Changing the Path of the Motion



The motion tween of the left car that you just animated shows a colored line with dots indicating the path of the motion. The path of the motion can be edited easily so that the car travels in a curve, or the path can be moved, scaled, or even rotated just like any other object on the Stage.

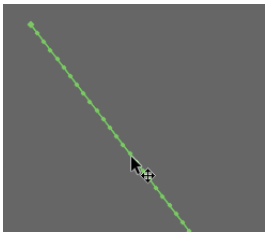
To better demonstrate how you can edit the path of the motion, open the sample file 04MotionPath.fla. The file contains a single Tween layer with a rocket ship moving from the top left of the Stage toward the bottom right.

Moving the path of the motion

You will move the path of the motion so the relative movement of the rocket ship remains the same, but its starting and ending positions change.

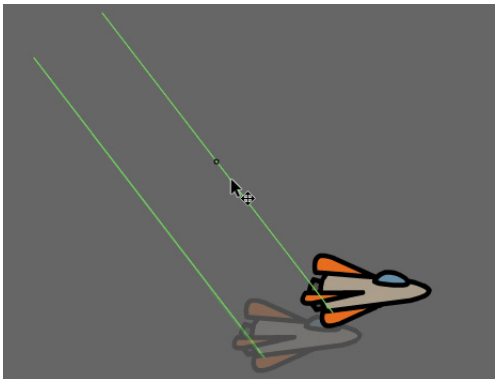
1. Choose the Selection tool.
2. Click on the path of the motion to select it.

   The path of the motion becomes highlighted when it is selected.



3. Click and drag the motion path to move it to a different place on the Stage.

   The relative motion and timing of the animation remain the same, but the starting and ending positions are relocated.

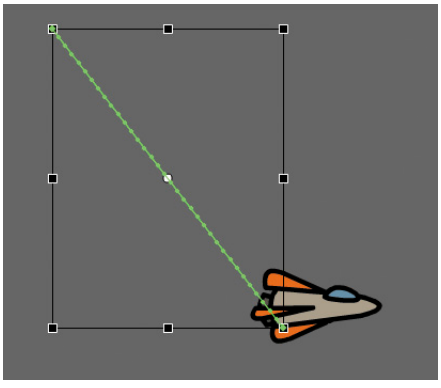


Changing the scale or rotation of the path

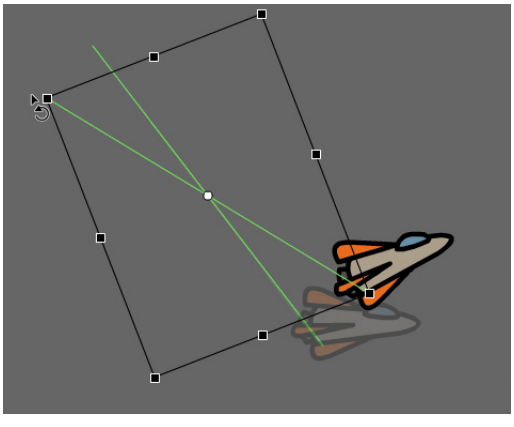
You can also manipulate the path of the object's motion using the Free Transform tool.

1. Select the path of the motion.
2. Choose the Free Transform tool.

   Transformation handles appear around the path of the motion.



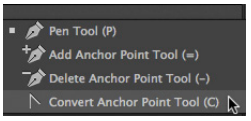
3. Scale or rotate the path of the motion as desired. You can make the path smaller or larger, or rotate the path so the rocket ship starts from the bottom left of the Stage and ends at the top right.



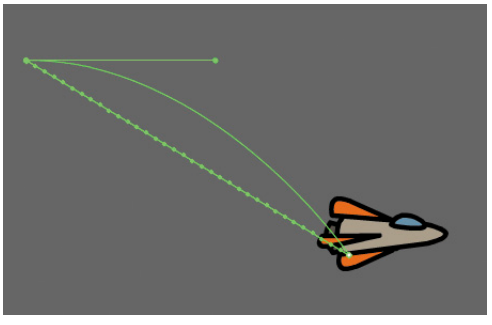
Editing the path of the motion

Making your objects travel on a curved path is a simple matter. You can either edit the path with Bezier precision using anchor point handles, or you can edit the path in a more intuitive manner with the Selection tool.

1 Choose the Convert Anchor Point tool, which is hidden under the Pen tool.



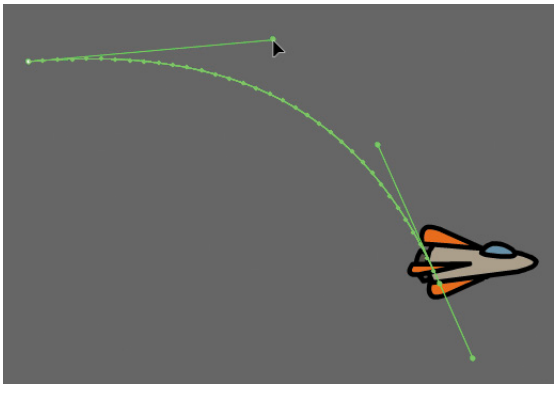
2 Click on the starting point or the ending point of the motion path on the Stage and drag the control handle out from the anchor point.



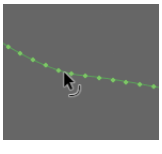
The handle on the anchor point controls the curvature of the path.

3 Choose the Subselection tool.

4 Click and drag the handle to edit the curve of the path. Make the rocket ship travel in a wide curve.



Note: You can also directly manipulate the path of the motion with the Selection tool. Choose the Selection tool and move it close to the path of the motion. A curved icon appears next to your cursor indicating that you can edit the path. Click and drag the path of the motion to change its curvature.

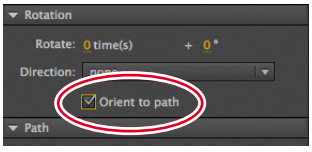


Orienting objects to the path

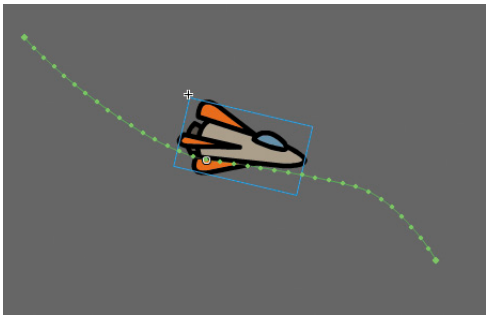
Sometimes the orientation of the object traveling along the path is important. In the motion picture splash page project, the orientation of the car is constant as it rumbles forward. However, in the rocket ship example, the rocket ship should follow the path with its nose pointed in the direction in which it is heading. The Orient to path option in the Properties inspector gives you this option.

1 Select the motion tween on the Timeline.

2 In the Properties inspector, under Rotation, select the Orient to path option.



Flash inserts keyframes for rotation along the motion tween so that the nose of the rocket ship is oriented to the path of the motion.



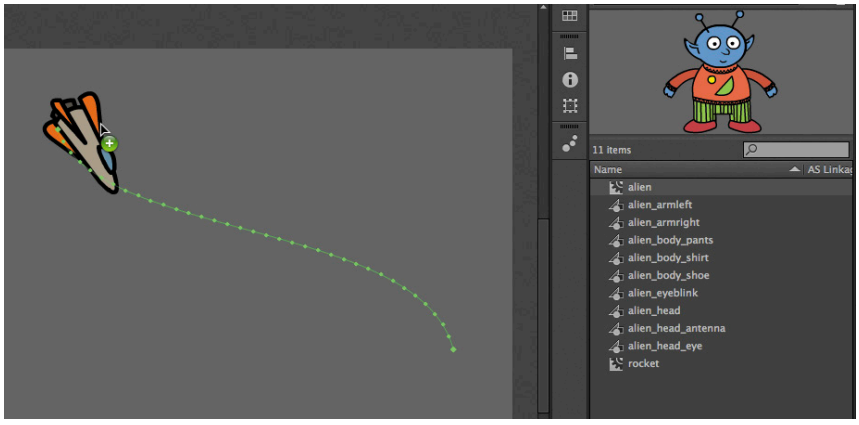
Note: To direct the nose of the rocket ship, or any other object, along the path of its motion, you must orient its position so that it is facing in the direction that you want it to travel. Use the Free Transform tool to rotate its initial position so that it is oriented correctly.

Swapping Tween Targets

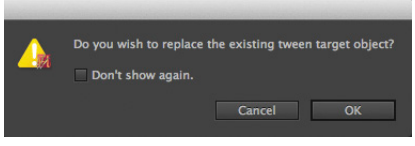
The motion tween model in Flash Professional is object-based. This means that an object and its motion are independent of each other, and you can easily swap out the target of a motion tween. If, for example, you'd rather see an alien moving around the

Stage instead of a rocket ship, you can replace the target of the motion tween with an alien symbol from your Library panel and still preserve the animation.

1 Drag the movie clip symbol of the alien from the Library panel onto the rocket ship.

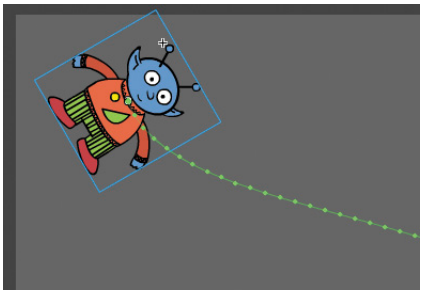


2 Flash asks if you want to replace the existing tween target object with a new object.

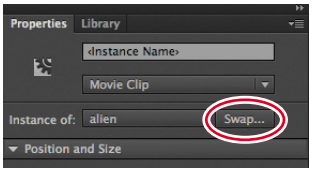


3 Click OK.

Flash replaces the rocket ship with the alien. The motion remains the same, but the target of the motion tween has changed.



Note: You can also swap instances in the Properties inspector. Select the object that you want to swap on the Stage. In the Properties inspector, click the Swap button. In the dialog box that appears, choose a new symbol and click OK. Flash will swap the target of the motion tween.



Creating Nested Animations

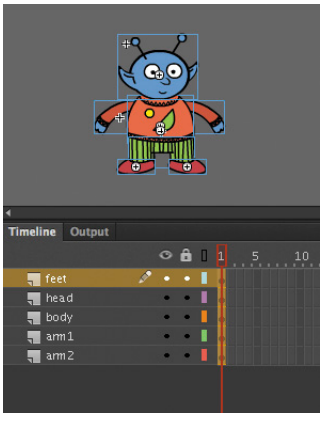
Often, an object that is animated on the Stage will have its own animation. For example, a butterfly moving across the Stage will have an animation of its wings flapping as it moves. Or the alien that you swapped with the rocket ship could be waving his arms. These kinds of animations are called *nested animations*, because they are contained inside the movie clip symbols. Movie clip symbols have their own Timeline that is independent of the main Timeline.

In this example, you'll make the alien wave his arms inside the movie clip symbol, so he'll be waving as he moves across the Stage.

Creating animations inside movie clip symbols

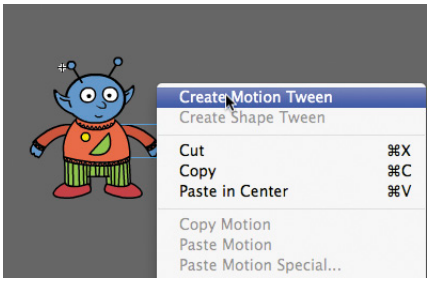
1 In the Library panel, double-click the alien movie clip symbol icon.

You are now in symbol-editing mode for the alien movie clip symbol. The alien appears in the middle of the Stage. In the Timeline, the parts of the alien are separated in layers.

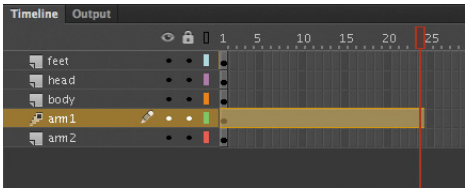


2 Choose the Selection tool.

3 Right-click/Ctrl-click on the alien's left arm and choose Create Motion Tween.



Flash converts the current layer to a Tween layer and inserts 1-second's worth of frames so you can begin to animate the instance.



4 Choose the Free Transform tool.

5 Drag the corner rotation control points to rotate the arm upward to the alien's shoulder height.

Flash inserts a keyframe at the end of the motion tween. The left arm rotates smoothly from the resting position to the outstretched position.

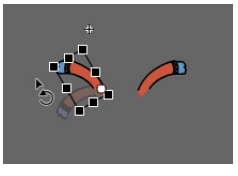
6 Move the red playhead back to frame 1.

7 Now create a motion tween for the alien's other arm. Right-click/Ctrl-click on his right arm and choose Create Motion Tween.

Flash converts the current layer to a Tween layer and inserts 1-second's worth of frames so you can begin to animate the instance.

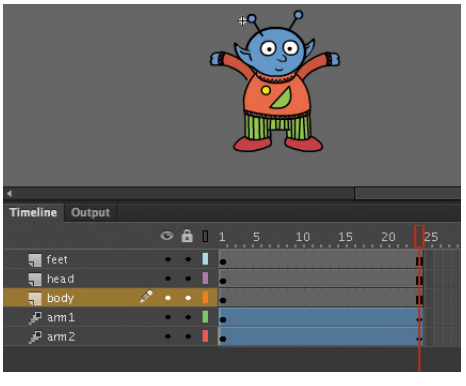
8 Choose the Free Transform tool.

9 Drag the corner rotation control points to rotate the arm upward to the alien's shoulder height.



Flash inserts a keyframe at the end of the motion tween. The arm rotates smoothly from the resting position to the outstretched position.

10 Select the last frame in all the other layers and insert frames (F5) so that the head, body, and feet all remain on the Stage for the same amount of time as the moving arms.

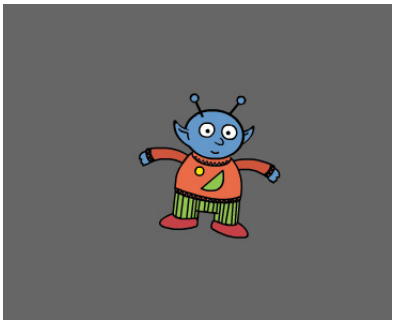


11 Exit symbol-editing mode by clicking the Scene 1 button in the Edit Bar at the top of the Stage.

Your animation of the alien raising his arms is complete. Wherever you use the movie clip symbol, the alien will continue to play its nested animation.

12 Preview the animation by choosing Control > Test Movie > in Flash Professional.

Flash opens a window showing the exported animation. The alien moves along the motion path while the nested animation of his arms moving plays and loops.



Note: Animations inside of movie clip symbols won't play on the main timeline. Choose Control > Test Movie > in Flash Professional to preview nested animations.

Note: Animations inside movie clip symbols will loop automatically. To prevent the looping, you need to add ActionScript to tell the movie clip Timeline to stop on its last frame. You'll learn more about ActionScript in Lesson 6.

Easing

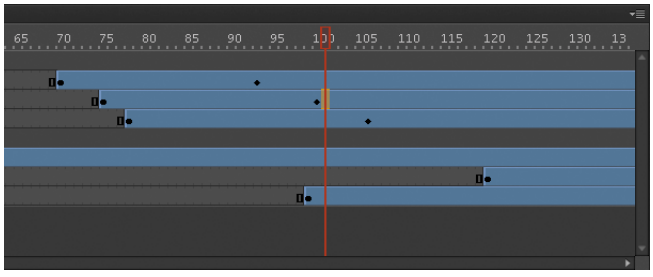
Easing refers to the way in which a motion tween proceeds. You can think of easing as acceleration or deceleration. An object that moves from one side of the Stage to the other side can start off slowly, then build up speed, and then stop suddenly. Or, the object can start off quickly, and then gradually slow to a halt. Your keyframes indicate the beginning and end points of the motion, but the easing determines how your object gets from one keyframe to the next.

You apply easing to a motion tween from the Properties inspector. Easing values range from –100 to 100. A negative value creates a more gradual change from the starting position (known as an ease-in). A positive value creates a gradual slowdown (known as an ease-out).

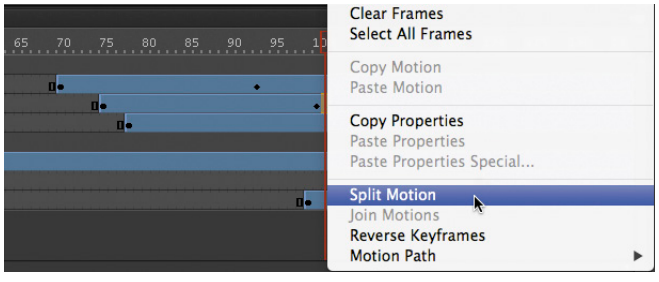
Splitting a motion tween

Easing affects the entire span of a motion tween. If you want the easing to affect only frames between keyframes of a longer motion tween, you should split the motion tween. For example, return to the 04_workingcopy.fla file of the cinematic animation. The motion tween of the car in the Left_car layer begins at frame 75 and ends at frame 190, at the very end of the Timeline. However, the actual movement of the car starts at frame 75 and ends at frame 100. You'll split the motion tween so you can apply an ease to the tween just from frames 75 to 100.

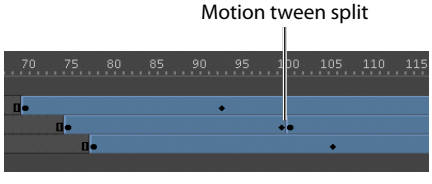
1 In the Left_car layer, select frame 101, which is the frame just after the second keyframe where the car ends its movement.



2 Right-click/Ctrl-click on frame 101 and choose Split Motion.



Flash cuts the motion tween into two separate tween spans. The end of the first tween is identical to the beginning of the second tween.

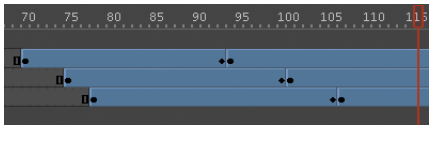


3 In the Middle_car layer, select frame 94, and right-click/Ctrl-click and choose Split Motion.

Flash cuts the motion tween into two separate tween spans.

4 In the Right_car layer, select frame 107, and right-click/Ctrl-click and choose Split Motion.

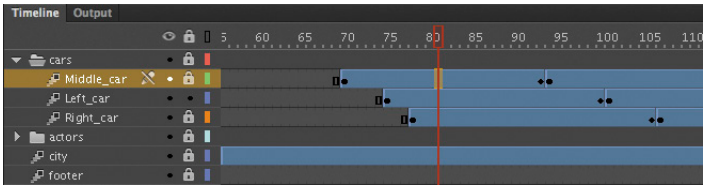
Flash cuts the motion tween into two separate tween spans. The motion tweens of all three cars are split.



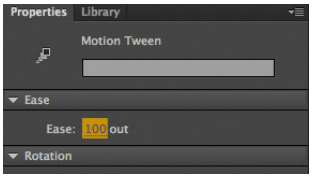
Setting eases of a motion tween

You'll apply an ease-in to the motion tweens of the approaching cars to give them a sense of weight and decelerate as real cars would.

1 In the Middle_car layer, select any frame between the first and second keyframes of the first motion tween (frame 70 to frame 93).

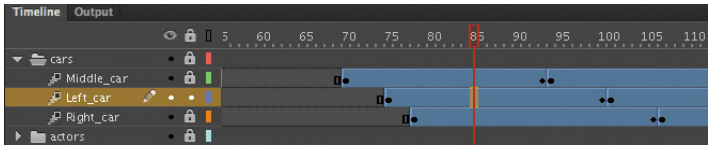


2 In the Properties inspector, enter 100 for the Ease value.



Flash applies an ease-out effect to the motion tween.

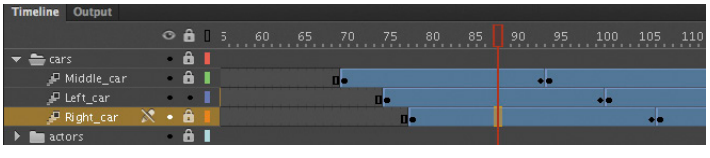
3 In the Left_car layer, select any frame between the first and second keyframes of the first motion tween (frame 75 to frame 100).



4 In the Properties inspector, enter **100** for the Ease value.

Flash applies an ease-out effect to the motion tween.

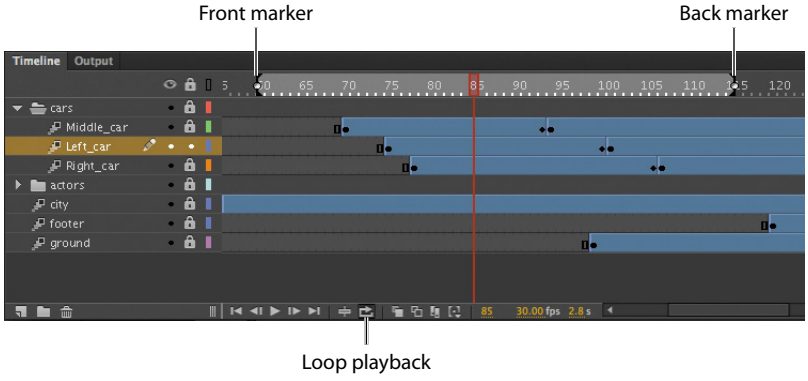
5 In the Right_car layer, select any frame between the first and second keyframes of the first motion tween (frame 78 to frame 106).



6 In the Properties inspector, enter **100** for the Ease value.

Flash applies an ease-out effect to the motion tween.

7 Enable the Loop Playback option at the bottom of the Timeline, and move the front and rear markers to bracket frames 60 to 115.



8 Click Play (Enter/Return).

Flash plays the Timeline in a loop between frames 60 to 115 so you can examine the ease-out motion of the three cars.

Frame-by-Frame Animation

Frame-by-frame animation refers to the illusion of movement created by seeing the incremental changes between every keyframe. It's the closest to traditional hand-drawn cel animation, and it's just as tedious. In Flash, you can change a drawing in every keyframe, and create a frame-by-frame animation.

Frame-by-frame animations increase your file size rapidly because Flash has to store the contents for each keyframe. Use frame-by-frame animation sparingly.

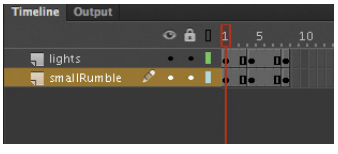
In the next section, you'll insert a frame-by-frame animation inside the carLeft movie clip symbol to make it move up and down in a jittery fashion. When the movie clip loops, the car will rumble slightly to simulate the idle of the motor.

Inserting a new keyframe

The frame-by-frame animations inside the carMiddle and carRight movie clip symbols have already been done. You'll finish the animation for the carLeft symbol.

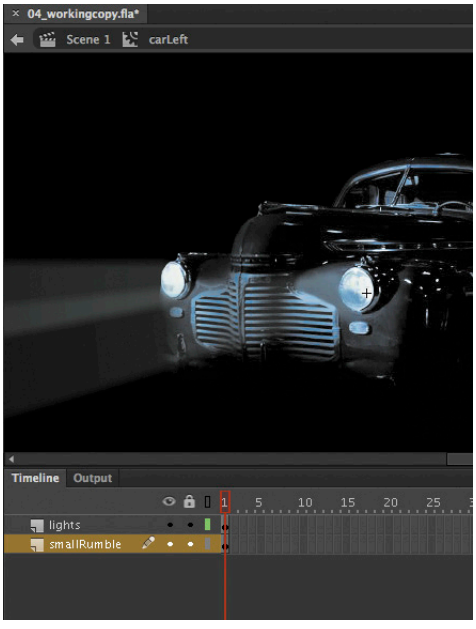
1 In the Library panel, double-click the carRight movie clip symbol to examine its completed frame-by-frame animation.

Inside the carRight movie clip, three keyframes establish three different positions for the car and its headlights. The keyframes are spaced unevenly to provide the unpredictable up and down motion.

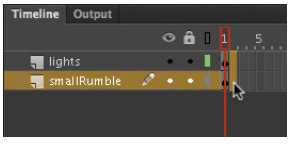


2 In the Library panel, double-click the carLeft move clip symbol.

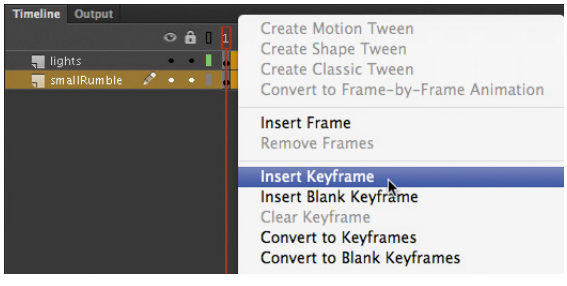
You enter symbol-editing mode for the carLeft symbol.



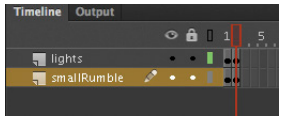
3 Select frame 2 in both the lights layer and the smallRumble layer.



4 Right-click/Ctrl-click and choose Insert Keyframe (F6).



Flash inserts a keyframe in frame 2 of the lights layer and the smallRumble layer. The contents of the previous keyframes are copied into the new keyframes.



Changing the graphics

In the new keyframe, change the appearance of the contents to create the animation.

1. In frame 2, select all three graphics on Stage (Edit > Select All, or Ctrl/Command+A) and move them down the Stage 1 pixel. You can use the Properties inspector or press the Down Arrow key to nudge the graphics by 1 pixel.

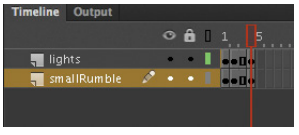
   The car and its headlights move down slightly.

2. Next, repeat the process of inserting keyframes and changing the graphics. For a random motion like an idling car, at least three keyframes are ideal.

3. Select frame 4 in both the lights layer and the smallRumble layer.

4. Right-click/Ctrl-click and choose Insert Keyframe (F6).

   Flash inserts a keyframe in frame 4 of the lights layer and the smallRumble layer. The contents of the previous keyframes are copied into the new keyframes.



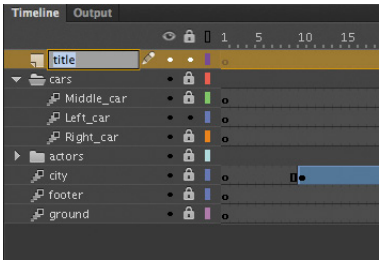
5. Select all three graphics on Stage (Edit > Select All, or Ctrl/Command+A) and move them up the Stage 2 pixels. You can use the Properties inspector or press the Up arrow key twice to nudge the graphics by 2 pixels.

   The car and its headlights move up slightly.

6. Test the idling motion by enabling the Loop Playback option at the bottom of the Timeline and click Play (Enter/Return).

Animating 3D Motion

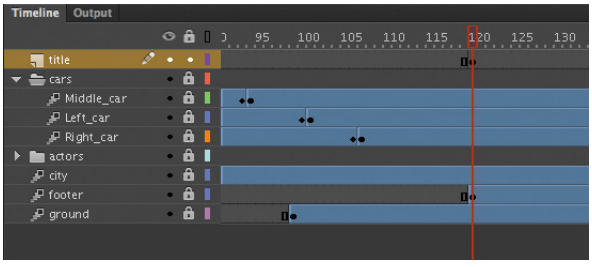
Finally, you'll add a title and animate it in 3D space. Animating in 3D presents the added complication of a third (*z*) axis. When you choose the 3D Rotation or 3D Translation tool, you need to be aware of the Global Transform option at the bottom of the Tools panel. The Global Transform option toggles between a global option (button depressed) and a local option (button raised). Moving an object with the global option on makes the transformations relative to the global coordinate system, whereas moving an object with the local option on makes the transformations relative to itself.



1. Click on Scene 1 in the Edit Bar to return to the main timeline, and insert a new layer at the top of the layer stack and rename it **title**.

2 Lock all the other layers.

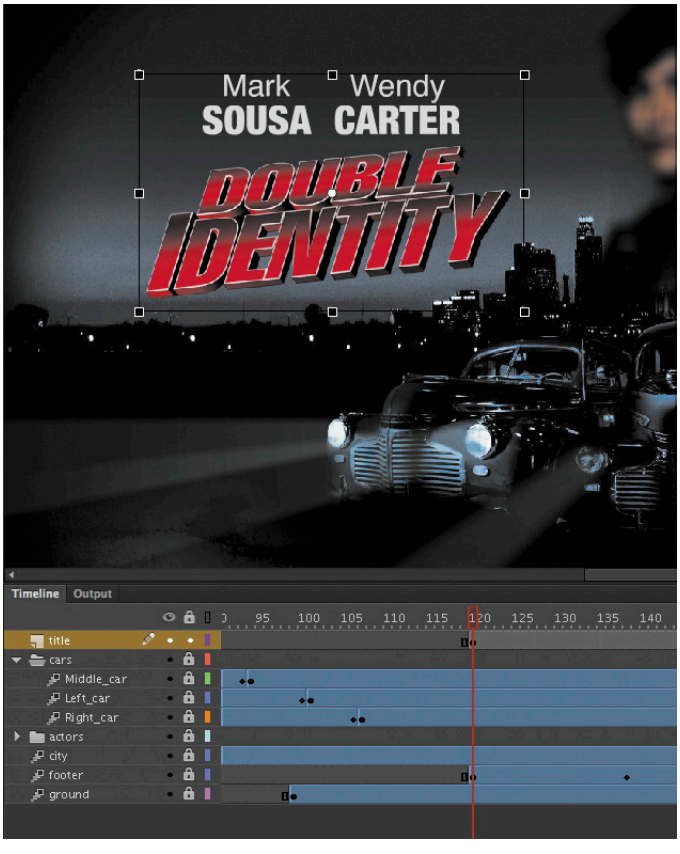
3 Insert a new keyframe at frame 120.



4 Drag the movie clip symbol called movietitle from the Library panel onto the Stage.

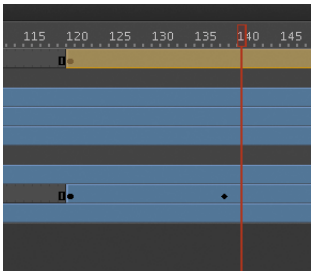
The movie title instance appears in your new layer in the keyframe at frame 120.

5 Position the title at x=**180** and y=**90**.



6 Right-click/Ctrl-click on the movie title and choose Create Motion Tween.

Flash converts the current layer to a Tween layer so you can begin to animate the instance.

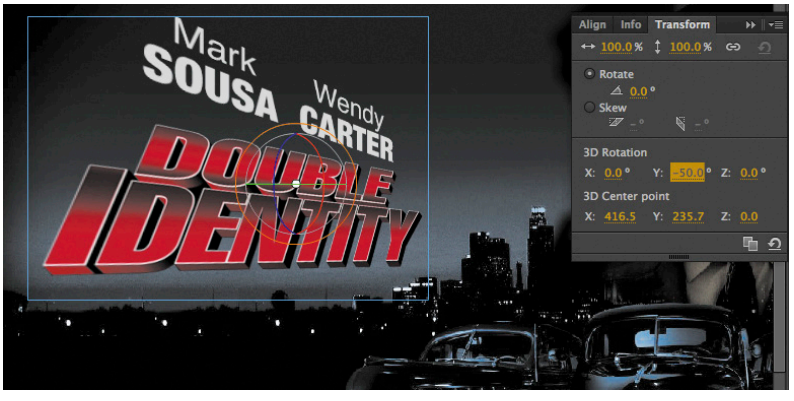


7 Move the red playhead to frame 140.

8 Select the 3D Rotation tool.

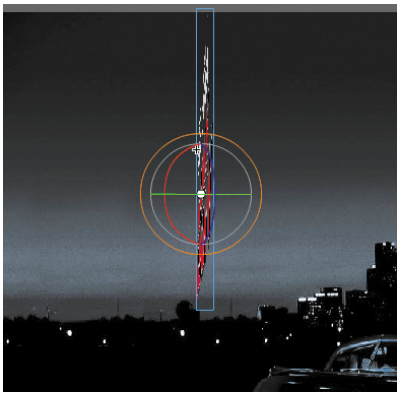
9 Deselect the Global Transform option at the bottom of the Tools panel.

10 Click and drag the title to rotate it around the *y*-axis (green) so that its angle is at about –50 degrees. You can check the rotation values in the Transform panel (Window > Transform).



11 Move the red playhead to the first keyframe at frame 120.

12 Click and drag the title to rotate it around the *y*-axis in the opposite direction so that the instance looks like just a sliver.



Flash motion-tweens the change in the 3D rotation, so the title appears to swing in three dimensions.

Testing Your Movie

You can quickly preview your animation by "scrubbing" the red playhead back and forth on the Timeline or by choosing Control > Play. You can also use the integrated controller at the bottom of the Timeline.

However, to preview your animation as your audience will see it and to preview any nested animations within movie clip symbols, you should test your movie. Choose Control > Test Movie > in Flash Professional.

Flash exports a SWF file and saves it in the same location as your FLA file. The SWF file is the compressed, final Flash media that you would embed in an HTML page to play in a browser. Flash displays the SWF file in a new window with the exact Stage dimensions and plays your animation.

Note: The exported SWF in Test Movie mode will loop automatically. To prevent the looping in Test Movie mode, choose Control > Loop to deselect the loop option.

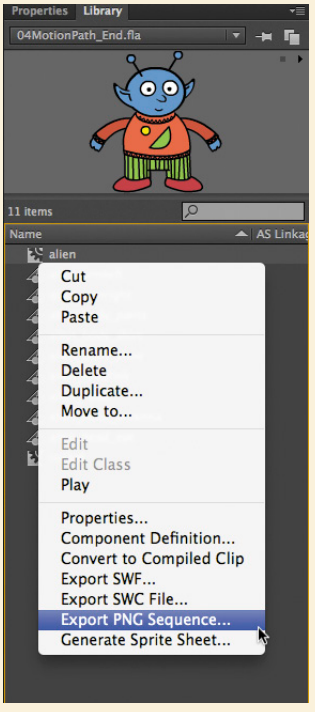
To exit Test Movie mode, click the Close window button.

You can also preview your animation by choosing Control > Test Movie > in Browser, and Flash will export a SWF file and open it automatically in your default browser.

Note: If you've targeted a different publishing platform in the Publish Settings (such as Adobe AIR), those options will be available for you in the Control > Test Movie menu.

Generating PNG Sequences and Sprite Sheets

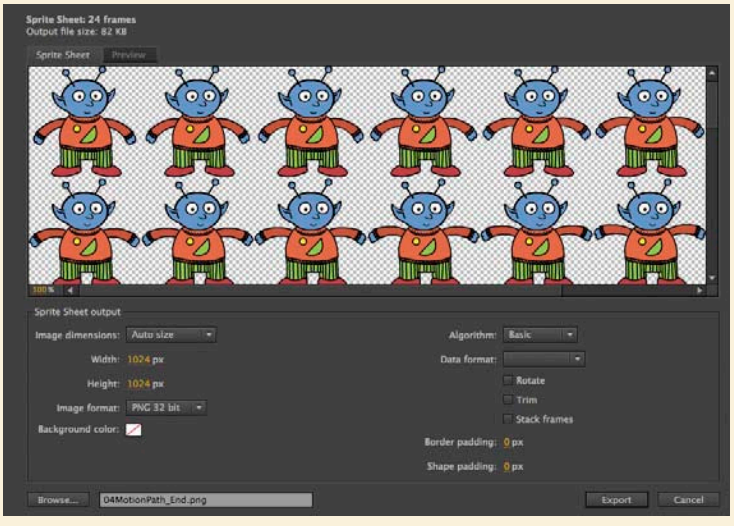
While you can create sophisticated animations to play as a SWF file with the Flash Player, you can also use Flash's powerful tools to create your animation and export it as a series of images for use in other environments. For example, animations with HTML5 or on mobile devices often rely on sequential PNG files or a single file that packs all the images organized in rows and columns known as a sprite sheet. The sprite sheet is accompanied by a data file that describes the position of each image, or sprite, in the file.



Generating either PNG sequences or a sprite sheet of your animation is easy. First, your animation must be within a Movie Clip symbol. In the Library panel, right-click/Ctrl-click the symbol and choose Export PNG Sequence.

In the next steps, you select the destination on your hard drive for your images and the dimensions of your images.

For a sprite sheet, right-click/Ctrl-click the symbol and choose Generate sprite sheet. The Generate Sprite Sheet dialog box that appears provides different options such as sizing, background color, and the particular data format.



Click Export to output the sprite sheet and data file. The data file determines what kind of development environment you'll use your sprite sheet in. For example, JSON, Starling, and cocos2D are some of the data formats available.

Review Questions

1. What are two requirements of a motion tween?
2. What kinds of properties can a motion tween change?
3. What are property keyframes, and why are they important?
4. How can you edit the path of an object's motion?
5. What does easing do to a motion tween?

Review Answers

1. A motion tween requires a symbol instance on the Stage and its own layer, which is called a Tween layer. No other tween or drawing object can exist on the Tween layer.
2. A motion tween creates smooth transitions between different keyframes of an object's location, scale, rotation, transparency, brightness, tint, filter values, or 3D rotation or translation.
3. A keyframe marks a change in one or more properties of an object. Keyframes are specific to each property, so that a motion tween can have keyframes for position that are different from keyframes for transparency.
4. To edit the path of an object's motion, choose the Selection tool and click and drag directly on the path to bend it. You can also choose the Convert Anchor Point tool and Subselection tool to pull out handles at the anchor points. The handles control the curvature of the path.
5. Easing changes the rate of change in a motion tween. Without easing, a motion tween proceeds linearly, where the same amount of change happens over time. An ease-in makes an object begin its animation slowly, and an ease-out makes an object end its animation slowly.

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