Sample Hands-On-Training[™] Chapter – Review Copy Only

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5. Shape Tweening

| What Is Shape Tweening? | | Shape Tweening Text | Shape Hinting | | Multiple Shape Tweening | Layer Folders | | Layer Properties | Animating Gradients |

chap_05

Macromedia Flash MX H•O•T CD-ROM Most of you have seen animations on the Web or on television that show an object transforming (or morphing) from one shape into another. You can create this same effect in your Macromedia Flash MX movies through a technique called shape tweening.

> The exercises in this chapter offer a thorough introduction to shape tweening. By working through them, you will expand your Macromedia Flash MX skill set to include shape tweening, hinting, animating gradients, and multiple shape tweening.

What Is Shape Tweening?

Shape tweening works like this. If you wanted to create an animation that showed a square transforming into a circle, you could create the starting point of the animation—the square—and the ending point—the circle—by placing them on separate keyframes, leaving empty frames between them. You could then set up a shape tween and have Macromedia Flash MX automatically generate the art for the empty frames between the two images.

Before I describe shape tweening in more detail, I first need to define a few terms–shape, keyframes, and tweening. Here's a handy chart to refer to if these terms are new to you:

	Shape Tweening Definitions
Shape	
	In Macromedia Flash MX, a shape is a vector-based object or series of objects. You can create shapes in Macromedia Flash MX using any of the drawing tools, or you can bring shapes into Macromedia Flash MX from other vector-creation programs, such as Freehand or Illustrator. In order for a shape to be suitable for shape tweening, it cannot be composed of grouped objects, bitmaps, or symbols. (You will learn about symbols in Chapter 6, " <i>Symbols and Instances</i> ") Type can be the subject of a shape tween if it is first converted to a shape. This process is called "breaking apart." You will learn how to break type apart later in this chapter.
	In traditional animation, a "key" or "lead" animator would draw "extremes," or the important frames of artwork that define what the motion should look like. If, for example, you needed an anima- tion of a circle turning into a square, a key artist would draw two keyframes, the first with a circle and the second with a square. In Macromedia Flash MX, a keyframe is symbolized in the Timeline by a gray frame with a filled black circle at the bottom. In this example, the circle would be inside the first keyframe and the square would reside in the next keyframe.
	In Macromedia Flash MX, a keyframe is symbolized in the Timeline by a gray frame with a filled black circle at the bottom. In this example, the circle would be inside the first keyframe and the square would reside in the next keyframe. <i>continues on next page</i>

Shape Tweening Definitions continued								
Tweening								
	The term "tweening" is borrowed from traditional cel animation terminology, and is slang for "in-betweening." In cel animation, a person called an "in-betweener" would take the keyframes that a lead animator creates and draw all the frames that go between them that describe the motion. For example, the in-betweener would take the two keyframes just described and would use them to draw a series of images of the shapes in various stages of morphing from one object, the circle, into the other object, the square.							

Macromedia Flash MX lets you use shape tweening to animate between lines and shapes and to animate the colors and gradients that are applied to them. This process is often referred to as **morphing**. The illustrations that follow are a good example of a shape tween:







The next step is to apply a shape tween to the frames with a few clicks of the mouse. Macromedia Flash MX will then interpolate the difference between the keyframes and automatically generate all of the frames in between.

Shape tweening is the only process in Macromedia Flash MX that lets you quickly animate from one distinct shape to another. It can also be used to animate from one gradient to another, from one color to another, and/or from one position to another. As you might imagine, creating this kind of animation by drawing each frame of the artwork would be rather tedious. The shape tweening feature in Macromedia Flash MX automates this process.

The lists that follow outline some of the things that you can and can't do with shape tweens in Macromedia Flash MX.

What Shape Tweening Can Do

- Tween the shape of an object
- Tween the color of an object (including a color with transparency)
- Tween the position of an object on the Stage
- Tween the transformation (scale, rotation, skew) of an object
- Tween text that has been broken apart
- Tween gradients

What Shape Tweening Can't Do

- Tween grouped objects
- Tween symbols
- Tween text that has not been broken apart

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_____Shape Tweening Text

In the steps that follow, you will create an animation of a snowboard changing into the letter "X." This will introduce you to the basics of shape tweening.

1. Copy the **chap_05** folder, located on the **H**•**O**•**T CD**-**ROM**, to your hard drive. You will need to have this folder on your hard drive in order to save changes to the files inside it.

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2. Open the **textTweenFinal.fla** file from the **chap_05** folder. This is a finished version of the animation you will create in the following steps.

3. Press Enter/Return on the keyboard to preview the shape tweening animation. You will see the snowboard artwork turn into the letter "X." You will create this shape tween next.

4. Close the textTweenFinal.fla file.



5. Open the **textTween.fla** file from the **chap_05** folder. This file contains two layers: one named **boarding text** with the word "boarding" on it and one named **tween** with the snowboard shape on it. You will be working on the layer named **tween**.



6. On the **tween** layer, press **F7** on **Frame 10**. This adds a blank keyframe to Frame 10. You are adding a blank keyframe rather than a keyframe because you want to add new artwork on Frame 10, not copy the artwork from Frame 1.



7. Notice that after the first frame, the word "boarding" disappears. This happens because the **boarding** layer has only one frame, while the **tween** layer now has 10 frames. In order for the word "boarding" to appear throughout the entire animation, the **boarding** layer must also contain 10 frames. Click on **Frame 10** and press **F5** on Frame 10 in the **boarding** layer to add frames up to Frame 10 on that layer.



8. In the **Toolbox**, select the **Text** tool. Select **Frame 10** on the **tween** layer, click on the **Stage**, and type the capital letter **X** in **Frame 10** just before the letter "b" in the word "boarding," as shown above.

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Note: I used the Arial font, size 78, white, and bold to type the "X," but you can use whatever font and size you like. You will learn more about the text options in Macromedia Flash MX in Chapter 12, "Working with Text."



9. Using the **Arrow** tool, click to select the large **X** on the **Stage**. Drag the **X** to position it before the letter "b," with a little space between the "X" and the "b," as shown above.



When you type text using the Text tool, the "X" is still in an editable format, which means you can double-click on it at any time and change the letter to something else. If you deselect the text and use the Arrow tool to select it again, you will see a blue bounding box and no selection mesh, indicating that it is not a shape.

To use text in a shape tween, you have to make it a shape by breaking it apart. The act of breaking text apart converts it from editable text into an editable shape. You must do this because editable type cannot be the source of a shape tween. It's one of the rules of shape tweening—you can't use grouped objects or symbols either. While you might not think of type as a grouped object, by Macromedia Flash MX's definition it must be broken apart to become a shape. You will learn more about working with text tools in Chapter 12.



10. With the X still selected, choose **Modify** > **Break Apart**. The text is broken apart and converted into a shape, ready to be shape tweened. The selection mesh over the "X" indicates that you are now working with a shape. This will be the last keyframe of your animation.



11. Click anywhere between the two keyframes to select a frame in the middle of that range of frames.

12. Make sure the Property Inspector is open. If it is not, choose Window > Properties.

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13. In the Property Inspector, click to see the **Tween** drop-down menu and select **Shape** to apply a shape tween between the two keyframes.



Once you have applied a shape tween between two keyframes, the Timeline will be shaded green and a long arrow will appear between the keyframes. This is a visual indication that a shape tween is active.

14. Press Enter/Return to test your tween. You will see the snowboard turning into the letter "X".

15. When you are finished testing, save this file and keep it open for the next exercise.



2._____Shape Hinting

When working with shape tweening, Macromedia Flash MX will automatically determine how to change from one shape to the next. Because this is an automatic process, you don't have complete control over how the tween occurs. **Shape hinting** is a feature that helps you regain some control over a tween. It is used primarily to fix a shape tween that does something you don't want it to do. In this exercise, you will take the shape tween that you created in the previous exercise and add shape hints to better control how the snowboard morphs into the "X".

1. You should still have the file from the previous exercise (**textTween.fla**) open. If you don't, go ahead and open it now.



2. Press Enter/Return to preview this shape tween.

Notice that, as the shape tween progresses, the snowboard appears to crumple up like a piece of paper and then all of a sudden pop into the letter "X." That is how Macromedia Flash MX decided to create this shape tween. What if you want the tween to appear more fluid? You'll learn how to do this using shape hinting in the steps that follow.



3. Make sure the **Playhead** is over **Frame 1**. When you add shape hints, you must start on the first frame of your animation.

4. Choose Modify > Shape > Add Shape Hint.



5. A red circle with an "a" in it will appear in the middle of the snowboard. This is a shape hint. Click and drag the **shape hint** to the upper left corner of the snowboard shape. **Note:** You must use the **Arrow** tool from the **Toolbox** to do this.



6. Move the Playhead to the last frame (Frame 10) of your animation.



7. Click and drag the **shape hint** (the small "a") to the upper left inside corner of the **X**, as shown above. This will make sure that the upper left corner of the snowboard ends up as the upper left corner of the letter "X."

When you let go of your mouse, notice that the shape hint changes from red to green. Why? This is how you know that the shape hint has been accepted. When your shape hint doesn't turn green on the ending keyframe, it means that it was not placed in the same (or in a similar) location as the first shape hint. The Macromedia documentation states that shape hints are yellow in the starting keyframe, green in the ending keyframe, and red when they are not on a curve. However, this is not always the case, as shown in this exercise, where the "X" shape has no curves but the hints still turn green. In order for shape hints to work properly, your best bet is to place them in similar locations on each keyframe and to pay more attention to how the tween animates than to the color of the hints. If necessary, try repositioning your shape hint for a better tween effect. Sometimes it takes just a small adjustment for Macromedia Flash MX to get the hint (pun intended)!

8. Press Enter/Return to preview the effect of changing the shape tween by using a shape hint. Notice that the shape tween looks better. You will make the transition even smoother by adding more shape hints next.

9. In the **Timeline**, click on **Frame 1** to make sure the Playhead is over the first frame. Choose **Modify > Shape > Add Shape Hint** to add another shape hint.



10. The second shape hint will appear as a small "b" in the middle of the snowboard. Click and drag the second **shape hint** to the upper right corner of the snowboard shape, as in the picture above.

TIP | Multiple Shape Hints

After you add a second shape hint, it appears as a red circle with the letter "b" rather than an "a" in the middle of it. The next shape hint after that will be "c", and so on. I think you see the pattern here. When you get to "z", that's it! You're all out of shape hints. You're given a total of 26 shape hints per shape tween. But don't worry; 26 shape hints should be far too many for most animations. If you find yourself needing more than 26 shape hints, you might want to rethink the complexity of your animation, as by then it is probably going to put a lot of strain on the end user's computer processor.



11. Move the **Playhead** to the last frame (**Frame 10**) of your animation. Click and drag the second **shape hint** ("b") to the upper right outside corner of the **X**, as shown above.

12. Press Enter/Return to preview the effect of changing the shape tween by adding another shape hint. Notice that the shape tween transition is getting better.





13. In the **Timeline**, click on **Frame 1** to select the first frame. Repeat steps 9, 10, and 11 two more times to add two more shape hints, moving them to the remaining corners of the "X." When you are finished, Frame 1 and Frame 10 should look like the pictures above.

14. Press Enter/Return to test the shape tween with four shape hints.

Try experimenting by moving the shape hints around. Moving them even slightly can give a completely different look to your shape tween. Now that you know how to add shape hints, you should learn how to remove them as well. The following steps show you how to remove a shape hint.

15. Click and drag the Playhead back to Frame 1.



16. Right-click (Windows) or Ctrl+click (Mac) on the shape hint with a "d" on it. Choose Remove Hint from the pop-up menu. This will remove the selected shape hint and returns the animation back to the point of using just three shape hints.

17. Press Enter/Return to test the shape tween animation again. Go ahead and experiment removing another shape hint and notice how it affects the animation.

18. When you are finished, save and close this file-you won't need it to complete the next exercise.

TIP | Quickly Removing Shape Hints

If you add too many shape hints and really mess up your animation, don't worry. You can remove them all with just a few clicks. Right-click (Windows) or Ctrl+click (Mac) on any shape hint and select **Remove All Hints** from the pop-up menu. You can also select **Modify > Shape > Remove All Shape Hints**. Either option will remove every shape hint from your animation. Thank goodness for this feature!

_____Multiple Shape Tweening

3.

So far, you have learned how to create single shape tweens. There will likely come a time, however, when you will want to create more than one shape tween in your project. In this exercise, you will learn how to create **multiple shape tweens** by placing them on separate layers using the **Distribute to Layers** feature (new to Macromedia Flash MX). Working with multiple layers is the only way to choreograph animations with multiple tweens. This exercise will also introduce the **Layer Folder** feature (also new to Macromedia Flash MX), which is a wonderful way to organize and consolidate animations that contain many different layers.



1. Open the **mutplShpTwnFinal.fla** file from the **chap_05** folder. This file contains a finished version of the shape tween animation you are about to create.

2. Press Enter/Return on your keyboard to preview this file. If you can't see the entire Stage, choose View > Magnification > Show All so that you can see the whole multiple shape tween animation. Notice the Folder icon in the Layers section of the Timeline, with all the layers in it. This designates a Layer Folder, which you'll learn about near the end of this exercise. When you are finished previewing, close the file. You will learn to create this same animation in the steps that follow.



3. Open the file named **mutplShpTwn.fla** located inside the **chap_05** folder. Currently, this file has one layer with six different shapes on it.

Up to this point in the chapter, you have been creating shape tweens in which one shape turns into another on one layer. While it is possible to tween one shape into many shapes using only one layer, some effects require you to place your shapes on separate layers. The following steps show a good example of when it's necessary to put your shapes on separate layers.



4. Click on Frame 1 to select all the shapes on Frame 1, and choose Modify > Distribute to Layers.

The Distribute to Layers feature will take each selected shape and place it on its own layer. You can click on any of the shapes on the Stage, and you will see the corresponding layer become highlighted in the Timeline, as shown above.



5. Starting with Layer 2, double-click on each of the layer names to give them new, more descriptive names. Change Layer 2 to left bottom, Layer 3 to left top, Layer 4 to middle, Layer 5 to right bottom, and Layer 6 to right top, just as you see in the picture above. Make sure that the name you give to each layer matches the shape's location on the Stage. This makes it easier to know what shapes are on each of the layers.



If you want to see more layers in the Timeline, you can use the scroll bars on the right side of the Timeline, or you can click and drag to reveal more layers or even to see more of the layer names, as shown above.

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6. Starting with **Frame 6** on the layer named **left bottom**, click and drag down to select **Frame 6** on all the layers below the **left bottom** layer, as shown above.

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7. Press **F6** to add a keyframe on **Frame 6** of each layer you selected. Inserting a keyframe will copy the artwork from Frame 1 of each layer in the Timeline. This will serve as the ending keyframe of your shape tween animation.

8. Move the **Playhead** back to **Frame 1**. In the following steps, you will be altering the size of each shape in Frame 1, to serve as the beginning point of the shape tween animation.



9. In the Timeline, click the **Lock** icon, next to the small Eye icon, to lock all the layers at once. Click the **Lock** icon for the **left bottom** layer to unlock just that layer. This makes it much easier to work on just the shapes on the **left bottom** layer without affecting any of the other shapes.



10. Click on Frame 1 on the left bottom layer to select it. In the Toolbox, select the Free Transform tool, and then click and drag the upper right resize handle toward the lower left portion of the Stage. This will scale the shape down to create the starting point of the animation for the left bottom layer.

11. Click on the **dot** in the **Lock** column on the **left bottom** layer to lock that layer. Then click on the **Lock** icon for the **left top** layer to unlock that layer. You will be altering the size of the shape on this layer next.

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12. Click on Frame 1 on the left top layer to select it. In the Toolbox, select the Free Transform tool, and then click and drag the lower right resize handle toward the upper left of the Stage, just as you see in the picture above. This will scale the shape down to create the starting point for the animation in the left top layer.



13. Repeat steps 11 and 12 for the **middle**, **right top**, and **right bottom** layers. When you are finished, the shapes on all the layers on Frame 1 should look like the image above. You may need to use the Arrow tool to reposition the middle shape near the center of the Stage.

To animate the shapes, all you have left to do is to add a shape tween to each layer. You can add shape tweens to multiple layers at one time, as you will see next.



14. Unlock all the layers in the **Timeline**. Starting with the layer named **left bottom**, click and drag down between the two keyframes to select all the layers below the **left bottom** layer, as shown above.

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15. Make sure the **Property Inspector** is open. If it is not, choose **Window > Properties**. Select **Shape** from the **Tween** drop-down menu. This will automatically generate a shape tween between each of the two keyframes on all the layers.

16. Press the Enter/Return key to see the shape tweens in action! By using a multiple shape tween, you can have different animations on different layers all happening at the same time.

You are almost done! All you have left to do is to put your shape tween layers into a Layer Folder layer and you will learn how to do this next.



17. Double-click on the Layer 1 icon. This opens the Layer Properties dialog box. For the Name, type container and for the Type, select Folder. This changes Layer 1 into a Layer Folder and names the folder container. Click OK. A chart describing all the layer properties found in this dialog box is provided at the end of this exercise.

NOTE | What Is a Layer Folder?

A **Layer Folder** is a special kind of layer that can hold other layers inside of it. It is important to note that you cannot have artwork in a Layer Folder–the Layer Folder's sole purpose is to hold multiple layers so that you can keep your Timeline compact and organized.



18. In the **Timeline**, click on the **right top** layer name to select that layer, and then Shift+click on the **left bottom** layer name to select that layer and all of the layers in between. With all the layers selected, drag the layers onto the **container** layer. This will place all the layers in the Layer Folder. After you do this, notice that the layers are all indented under the Layer Folder.



19. Click on the **arrow** to the left of the **container** layer name to collapse the folder. Now you see the layers, now you don't! This is organization! You will really come to appreciate this feature when you work on projects that have tons of layers.

20. Press Enter/Return to preview your multiple shape tween animation again. Although you've moved the layers into a Layer Folder, the animation is left untouched.

21. When you are finished, save and close this file.

Layer Properties Defined

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The Timeline offers a number of ways of controlling layers, but other options are available in the Layer Properties dialog box that aren't visible in the Timeline. The following chart covers these additional options.

	Layer Properties
Option	Description
Guide	This option enables you to use the contents of a layer as a tracing image (or guide), which helps you create artwork on other layers. Guide layers are the only layers that are not exported with the movie. You will work with a Guide layer in Chapter 7, " <i>Motion Tweening</i> ."
Guided	A Guided layer is a layer that is linked to a Guide layer. The artwork on this layer can follow the path of the Guide layer it is linked to. Chapter 7, " <i>Motion Tweening</i> ," will give you hands-on experience working with Guided layers.
Mask	Selecting this option will turn the layer into a Mask layer. You will learn more about this layer type in Chapter 8, " <i>Bitmaps</i> ."
Masked	Selecting this option will cause the layer to be masked by the Mask layer above it. You will learn how to work with this option as well in Chapter 8, " <i>Bitmaps</i> ."
	continues on next page

	Layer Properties continued						
Option	Description						
Folder	Choosing this option will turn the layer into a Layer Folder so that you can organize your layers.						
Outline Color	This option specifies the color that will be used if you select the "View layer as outlines" option. By default, each layer will have a different color. This just gives you an extra bit of organizational control.						
Layer Height	This option makes a layer's Timeline display "taller" when you increase the line height of a specific layer. You can choose 100% (the default), 200%, or 300%. This feature is especially useful for working with sounds on the Main Timeline. Allowing the layer containing the sound to be taller makes it easier to work with the waveforms and to synchronize the sound with your animation. You will try this later in Chapter 13, " <i>Sound</i> ."						

4. _____Animating Gradients

Shape tweening can be used to create additional effects besides morphing one shape into another. You can also use the shape tween process to animate gradients. This can produce dramatic lighting effects, such as glows and strobes. In this exercise, you will learn how to modify and animate a gradient.



1. Open the animatedGradientFinal.fla file from the chap_05 folder.

2. Press Enter/Return to preview the animation. Notice that the gradient appears to move from left to right. This is a finished version of the animated gradient effect you will create in the following steps.

3. Close the **animatedGradientFinal.fla** file and open the **animatedGradient.fla** file from the **chap_05** folder. This file contains two layers: one with the dot on it, which is locked, and one named **text**, which is where you will create the gradient tween.



4. Click on **Frame 1** of the **text** layer to select the artwork in that frame. It contains text that has been broken apart so that you can apply a gradient fill to it.

TIP | Why Is the Text Broken Apart?

The text in this exercise file was broken apart because you can't apply a gradient to text, but you can apply a gradient to a shape. In order to re-create the animation of the gradient moving from one side of the word to the other, you have to work with shapes, so the text was broken apart for you ahead of time.



5. Make sure the **Color Mixer** panel is open. If it's not, choose **Window** > **Color Mixer**. With **Frame 1** in the **text** layer still selected, click on the **Fill Color** box to open the **Fill Color** palette. At the very bottom of this palette are some gradients. Choose the black and white radial gradient; it is second from the left.



As soon as you select the black and white radial gradient, the letter shapes on the Stage will change to reflect the new gradient fill color because they were already selected. You can click anywhere away from the Stage to deselect the shapes and see the gradient fill better. To create the effect of the gradient moving from one side of the word to the other, you will change the center of the gradient next.

6. Click on Frame 1 of the text layer to select all the shapes again.



7. In the **Toolbox**, select the **Paint Bucket** tool and click in the top left corner of the letter **X**, as shown above. The spot where you click defines the center of the radial gradient. Because the radial gradient is white in the center and black on the outside, the place where you click is where the white point of the gradient will be.

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8. On the **text** layer, press **F6** on **Frame 30** in the **Timeline** to add a new keyframe to the frame. As you might remember from Chapter 4, *"Animation Basics,"* pressing F6 copies the content from the previous keyframe and places it on the new keyframe. This can save you from having to re-create entire pieces of artwork, and it's especially useful when you want to make only minor changes.

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9. On the **dot** layer, press **F5** on **Frame 30** to add frames up to Frame 30 on this layer. This will allow the dot to be visible through Frame 30.

Tip: Even though the dot layer is locked, you can still add and delete frames in the Timeline–you just can't select the artwork or objects on the Stage in a locked layer.



10. Click on Frame 30 in the text layer to select it. In the Toolbox, make sure the Paint Bucket tool is still selected, and this time click on the top right of the letter **m**, as shown above. Now it appears as though a light source is coming from the opposite side of the word. This is the ending frame of your animation.

11. On the text layer, click anywhere between the two keyframes.



12. In the **Property Inspector**, choose **Shape** from the **Tween** drop-down menu to create a shape tween between the two keyframes.

13. Press Enter/Return to test your shape tween. Now it looks as though the word "xboarding.com" is being lit by a moving light source.

Don't be deceived by the word "shape" in "shape tweening." As you've just seen, shape tweens can be used to create animations that don't involve changing one shape into another. In this example, shape tweening was used to animate a gradient.

14. When you are finished, save and close this file-you won't be needing it anymore.

I hope this chapter uncovered the many secrets and nuances of shape tweening. You started with the simple concepts, using simple exercises, and then progressed quickly to a fairly advanced level with the multiple shape tweening and animated gradient exercises. As you gain experience in Macromedia Flash MX, shape tweening will likely become a technique you use often for many different types of effects. If you have the stamina, keep pressing forward to the next chapter. There's no rush though; the book will still be here tomorrow.