8 ANIMATING SHAPES AND USING MASKS

Lesson Overview

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

- Animate shapes with shape tweens
- Use shape hints to refine shape tweens
- Shape tween gradient fills
- View onion skin outlines
- Apply easing to shape tweens
- Create and use masks
- Understand mask limitations
- Animate the Mask and Masked layers

This lesson will take about one hour to complete. Please log in to your account on peachpit.com to download the lesson files for this chapter, or go to the Getting Started section at the beginning of this book and follow the instructions under "Accessing the Lesson Files and Web Edition."

You can easily morph—create organic changes in shape—with shape tweens. Masks provide a way to selectively show only parts of a layer. Together, they allow you to add more sophisticated effects to your animations.

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Getting Started

You'll start the lesson by viewing the animated logo that you'll create as you learn about shape tweens and masks in Adobe Animate CC.

1 Double-click the 08End.html file in the Lesson08/08End folder to play the animation in a browser. Your browser will need Flash Player to play the animation. Visit https://get.adobe.com/flashplayer/ for more information on installing and enabling Flash Player in your browser.

The project is an animation of a flame flickering at the top of a fictional company name. Not only does the shape of the flame change constantly, but so does the radial gradient fill inside the flame. A linear gradient sweeps across the letters of the company name from left to right. In this lesson, you'll animate both the flame and the colors that move across the letters.

2 Close your browser. Double-click the 08Start.fla file in the Lesson08/08Start folder to open the initial project file in Animate.

3 Choose File > Save As. Name the file **08_workingcopy.fla** and save it in the 08Start folder. Saving a working copy ensures that the original start file will be available if you want to start over.

Animating Shapes

In the previous lessons, you learned to create animations with symbol instances. You could animate the motion, scale, rotation, color effect, or filters applied to symbol instances. However, you couldn't animate the actual contours of a graphic. For example, creating an animation of the undulating surface of the ocean or the slithering motion of a snake's body is difficult—if not impossible—with motion or classic tweens. To do something more organic, you have to use shape tweening.

Shape tweening is a technique for interpolating stroke and fill changes between different keyframes. Shape tweens make it possible to smoothly morph one shape into another. Any kind of animation that requires the stroke or fill of a shape to

change—for example, animation of clouds, water, or fire—is a perfect candidate for shape tweening.

Because shape tweening applies only to shapes, you can't use groups, symbol instances, or bitmap images.

Understanding the Project File

The 08Start.fla file is an ActionScript 3.0 document that contains most of the graphics already completed and organized in different layers. However, the file is static, and you'll add the animation.

The text layer is at the very top and contains the company name, "Firestarter." The flame layer contains the flame, and the bottom layer, called glow, contains a radial gradient to provide a soft glow.
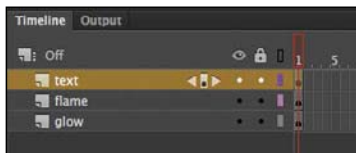
There are no assets in the library.

Creating a Shape Tween

To create the flickering flame effect, you'll animate the undulating changes in a flame's typical teardrop shape. You'll rely on shape tweening to handle the smooth morphing from one shape to the next, as well as the gradual shifts in color. A shape tween requires at least two keyframes on the same layer. The beginning keyframe contains a shape drawn with the drawing tools in Animate or imported from Adobe Illustrator. The ending keyframe also contains a shape. A shape tween interpolates the smooth changes between the beginning keyframe and the end keyframe.

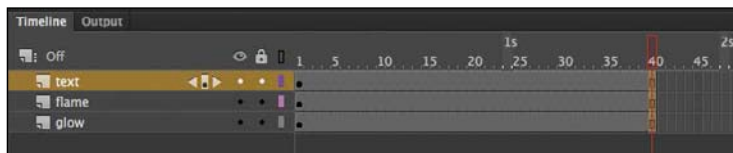### Establish keyframes containing different shapes

In the following steps, you'll animate the flame that will sit on top of the company name.

**1** Select frame 40 for all three layers.
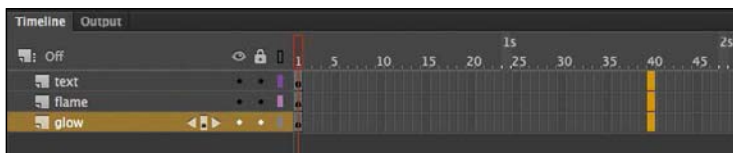
2 Choose Insert > Timeline > Frame (F5).

Frames are added to all three layers up to frame 40 to define the overall length of the animation.

3 Lock the text layer and the glow layer. This prevents you from accidentally selecting or moving the graphics in those layers.

4 After making sure that none of the frames are selected, right-click frame 40 in the flame layer and select Insert Keyframe, or choose Insert > Timeline > Keyframe (F6). The contents of the previous keyframe in frame 1 are copied into the new keyframe.

You now have two keyframes on the Timeline in the flame layer, at frame 1 and at frame 40. Next, you'll change the shape of the flame in the end keyframe.
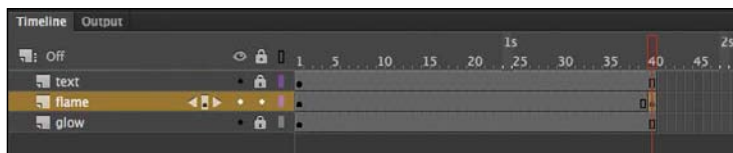
5 Select the Selection tool.

6 Click away from the shape to deselect it. Move your cursor close to the outlines of the shape, and drag the contours of the flame to make the flame skinnier.

The beginning keyframe and the end keyframe now contain different shapes—a fat flame in the beginning keyframe, and a skinny flame in the end keyframe in frame 40.

Apply the shape tween

Next, you'll apply a shape tween between the keyframes to create the smooth transitions

1 Click any frame between the beginning keyframe and the end keyframe in the flame layer.

2 Right-click, and choose Create Shape Tween. Or choose Shape Tween from the Insert menu.

Note Don't worry if your flame doesn't morph exactly the way you want it to . Small changes between keyframes work best . Your flame may rotate while going from the first shape to the second . You'll have a chance later in this lesson to refine the shape tweening with shape hints.
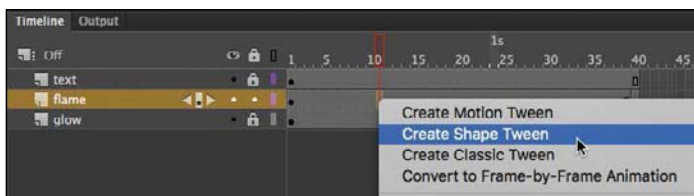
Animate applies a shape tween between the two keyframes, which is indicated by a black forward-pointing arrow and a green fill in the tween span.
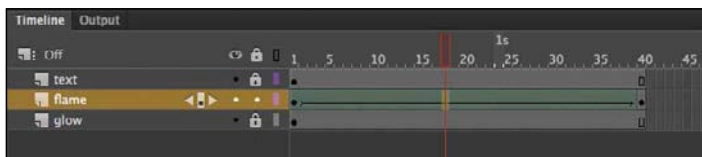
3 Watch your animation by choosing Control > Play (Enter/Return) or by clicking the Play button at the bottom of the Timeline.

You have created a smooth animation between the keyframes in the flame layer, morphing the shape of the first flame into the shape of the second flame.
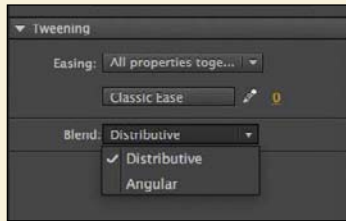
Changing the Pace

The keyframes of a shape tween can be easily moved along the Timeline in order to change the timing or pacing of the animation.

Moving a keyframe

The flame slowly transforms from one shape to another over a period of 40 frames. If you want the flame to make the shape change more rapidly, you need to move the keyframes closer together.

1 Select the last keyframe of the shape tween in the flame layer.
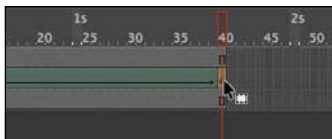
2 Make sure the box icon appears near your cursor. Drag the last keyframe to frame 6.

The shape tween shortens.
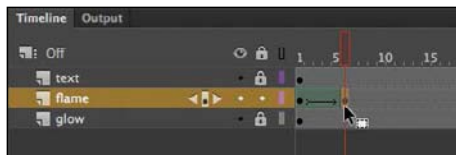
3 Press Enter/Return to play your animation.

The flame flickers quickly, and then remains static until frame 40.

Adding More Shape Tweens

You can add shape tweens by creating more keyframes. Each shape tween simply requires two keyframes to define its beginning state and its end state.

Insert additional keyframes

You want the flame to continually change shape, just like a real flame would. You'll add more keyframes throughout the animation and apply shape tweens between all the keyframes.
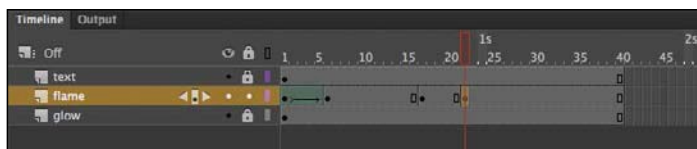
1 Right-click frame 17 in the flame layer and choose Insert Keyframe. Or choose Insert > Timeline > Keyframe (F6).

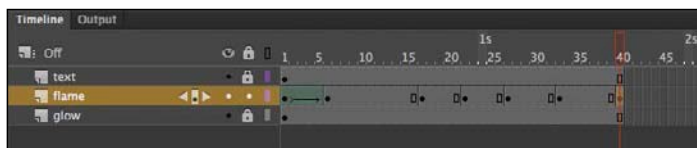The contents of the previous keyframe are copied into the second keyframe.
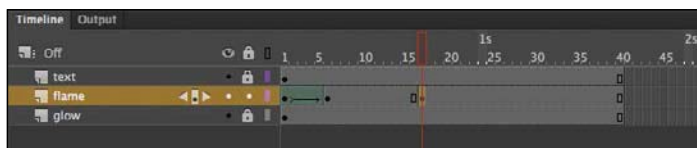
2 Right-click frame 22 in the flame layer and choose Insert Keyframe (F6).

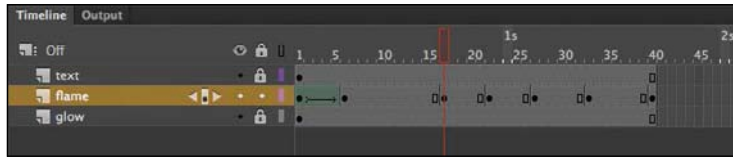The contents of the previous keyframe are copied into the new keyframe.

3 Continue inserting keyframes at frames 27, 33, and 40.

Your Timeline now has seven keyframes in the flame layer, with a shape tween between the first and second keyframes.
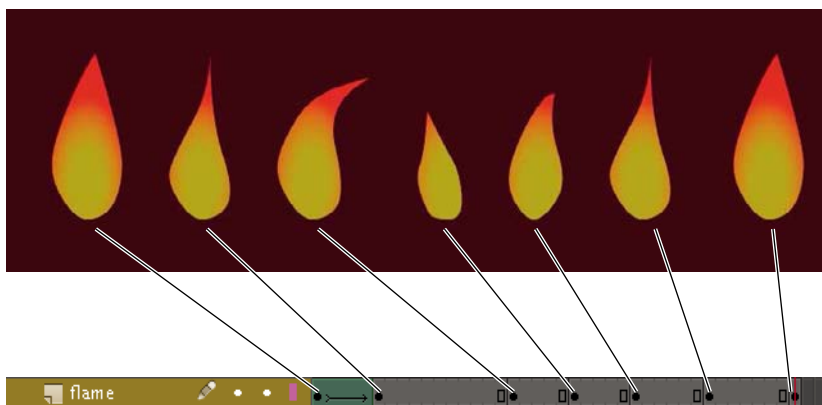
4 Move the red playhead to frame 17.

5 Select the Selection tool.

6 Click away from the shape to deselect it. Drag the contours of the flame to create another variation in its shape. You can make the base thicker, or change the curvature of the tip to make it lean left or right.
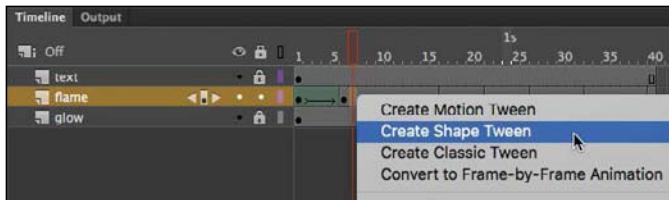

7 Modify the flame shapes in each of the newly inserted keyframes to create subtle variations.

## Extending the shape tweens

Your next step is to extend the shape tween so that the flame morphs from one shape to the next.
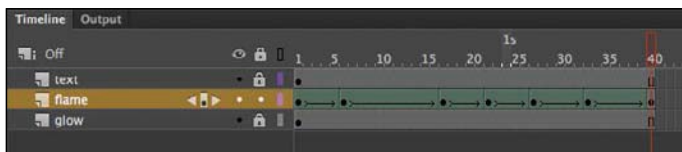
1 Right-click any frame between the second and third keyframes, and choose Create Shape Tween. Or choose Insert > Shape Tween.

A black forward-pointing arrow on a green background appears between the two keyframes, showing that you've applied a shape tween.
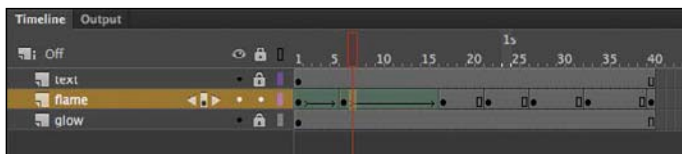
2 Continue to insert shape tweens between all the keyframes.

You should have six shape tweens in the flame   layer.


3 Press Enter/Return to watch the animation play.

Your flame flickers back and forth for the duration of the animation. Depending on how extensive your modifications to the flame have been, your flame may undergo some weird contortions between keyframes—for example, flipping or rotating unpredictably. Don't worry! You'll have a chance later in the lesson to refine your animation with shape hints.

Broken tweens

Every shape tween needs a beginning and an end keyframe with a shape inside each. If the last keyframe of a shape tween is missing, Animate shows the broken tween as a dotted black line (rather than a solid arrow).

Broken shape tween
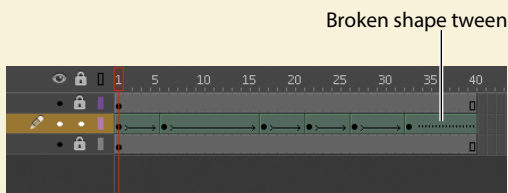
In this example, insert a keyframe at frame 40 to fix the tween.

Creating a Looping Animation

Your flame should flicker back and forth continuously for as long as the logo is onscreen. You can create a seamless loop by making the first and last keyframe identical and putting the animation inside a movie clip symbol. A movie clip timeline loops continuously, independently of the main Timeline.

Duplicating keyframes

Make the first keyframe identical to the last keyframe by duplicating its contents.

1 Right-click the first keyframe on the flame layer and select Copy Frames. Or choose Edit > Timeline > Copy Frames.
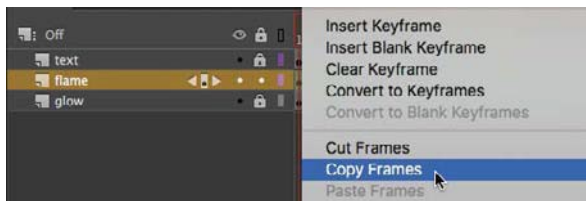
The contents of the first keyframe are placed on your clipboard.

2 Right-click the last keyframe on the flame layer and select Paste Frames. Or choose Edit > Timeline > Paste Frames.
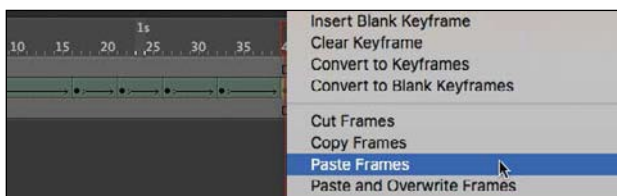
The first and last keyframes now contain identical flame shapes.

Previewing the loop

Use the Loop button at the bottom of the Timeline to preview your animation.

1 Click the Loop button at the bottom of the Timeline, or choose Control >Loop Playback (Alt+Shift+L/Option+Shift+L) to enable continuous playback when you play the movie.

Markers appear on the Timeline header indicating the range of frames that loop during playback. Next, adjust the markers to extend the loop to include the entire movie.

2 Extend the markers to include all the frames on your Timeline (frames 1 through 40), or click the Modify Markers button and choose Marker Range All.
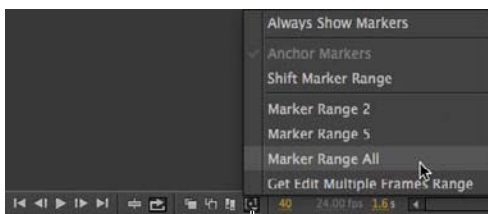
Modify Markers

3 Press Enter/Return to test the animation.

The flame animation plays and loops continuously. Click the Pause button or press Enter/Return again to stop the animation. Deselect the Loop button at the bottom of the Timeline to hide the markers and end the loop playback mode.
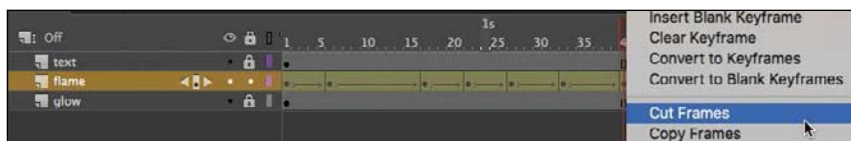
Inserting the animation into a movie clip

When your animation plays in a movie clip symbol, the animation loops automatically.

1 Select all the frames on the flame layer, right-click, and choose Cut Frames. Or choose Edit > Timeline > Cut Frames.


The keyframes and shape tweens are removed from the Timeline and placed on the clipboard.

2 Choose Insert > New Symbol (Ctrl+F8/Command+F8).

The Create New Symbol dialog box appears.

3 Enter **flame** as the name of the symbol, and choose Movie Clip as the Type. Click OK.
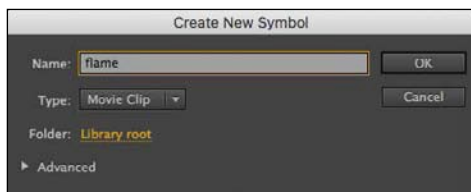
A new movie clip symbol is created and opens in symbol-editing mode.

4 Right-click the first frame on your movie clip timeline and select Paste Frames. Or choose Edit > Timeline > Paste Frames.
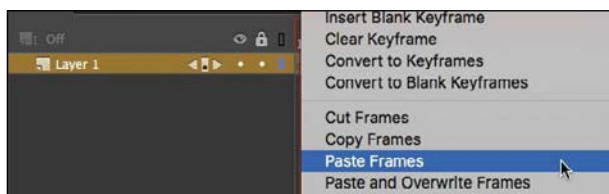
The flame animation from the main Timeline is pasted into your movie clip symbol's timeline.
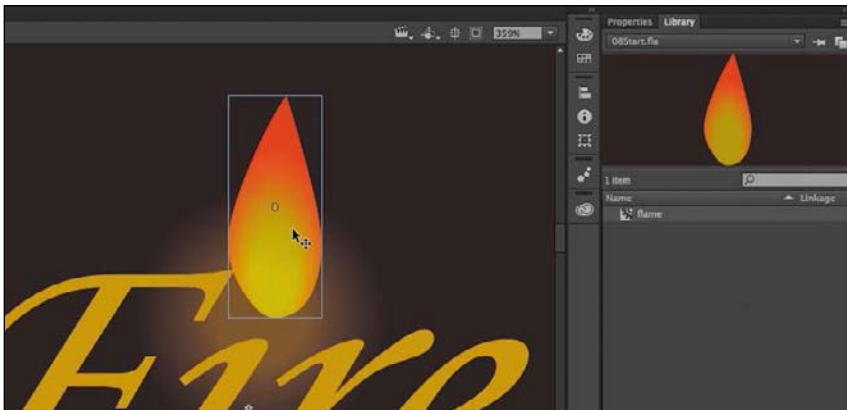
5 Click the Scene 1 button on the Edit bar at the top of the Stage, or choose Edit > Edit Document (Ctrl+E/Command+E).

You exit symbol-editing mode and return to the main Timeline.

6 Select the flame layer, which is currently empty. Drag your newly created flame movie clip symbol from the Library panel to the Stage.

An instance of the flame movie clip symbol appears on the Stage.

7 Choose Control > Test (Ctrl+Enter/Command+Return).

Animate exports the SWF in a new window, where you can preview the animation. The flame flickers continuously in a seamless loop.

Shape tweening with variable width strokes

Any aspect of a shape can be shape tweened, including variable widths of a shape's stroke. In Lesson 2, you learned to use the Width tool to create lines with thick and thin variations for more expressive graphics. You can change the width of the strokes in different keyframes, and when you apply a shape tween between those keyframes, Animate creates smooth interpolations of those stroke widths.

Considering the ability to animate the thickness of a shape's stroke, the contours of the stroke itself, and the inside fill of a shape, the creative possibilities are nearly limitless.

Using Shape Hints

Animate CC creates the smooth transitions between keyframes of your shape tween, but sometimes the results are unpredictable. Your shapes may go through strange contortions, flips, and rotations to get from one keyframe to another. You may like the effect, but more often than not you'll want to maintain control of the transformations. Using shape hints can help refine the shape changes.

Shape hints force Animate to map points on the start shape to corresponding points on the end shape. By placing multiple shape hints, you can more precisely control how a shape tween appears.

Adding shape hints

Now you'll add shape hints to the shape of the flame to modify the way it morphs from one shape to the next.

1 Double-click the flame movie clip symbol in the library to enter symbol-editing mode. Select the first keyframe of the shape tween in the flame layer.
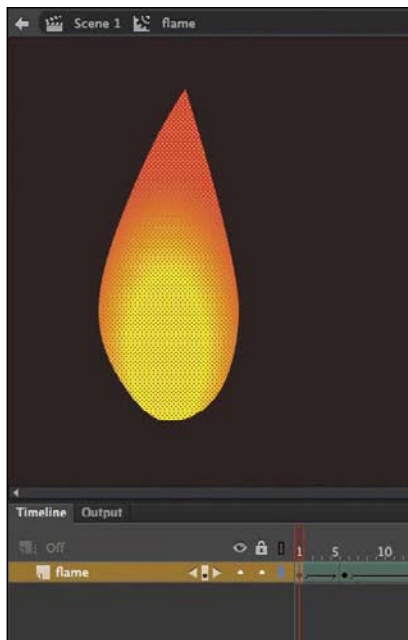
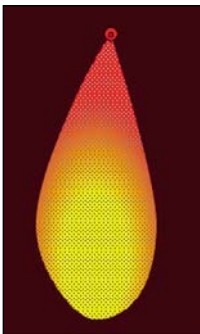**2** Choose Modify > Shape > Add Shape Hint (Ctrl+Shift+H/Command+Shift+H).

A red-circled letter "a" appears on the Stage. The circled letter represents the first shape hint.
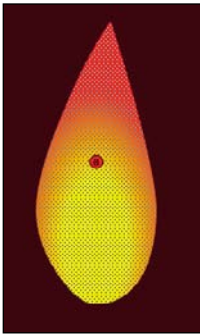
**3** Select the Selection tool and make sure that Snap To Objects is selected.

The magnet icon at the bottom of the Tools panel should be selected. Snap To Objects ensures that objects snap to each other when being moved or modified.

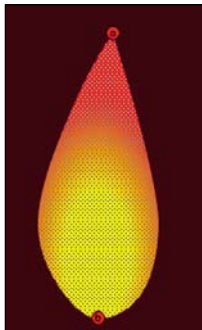**4** Drag the circled letter to the tip of the flame.

5 Choose Modify > Shape > Add Shape Hint again to create a second shape hint.
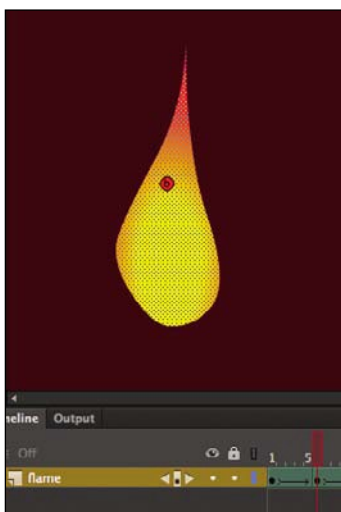
A red-circled "b" appears on the Stage.
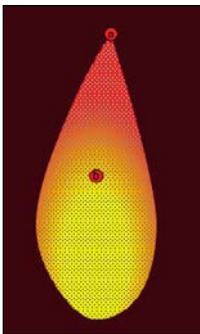
6 Drag the "b" shape hint to the bottom of the flame shape.

You have two shape hints mapped to different points on the shape in the first keyframe.

7 Select the next keyframe of the flame layer (frame 6).

A corresponding red-circled "b" appears on the Stage, hiding an "a" shape hint that is directly under it.

8 Drag the circled letters to corresponding points on the shape in the second keyframe. The "a" hint goes on the top of the flame, and the "b" hint goes on the bottom of the flame.

The shape hints turn green, indicating that you've correctly placed them.

9 Select the first keyframe.

Note that the initial shape hints have turned yellow, indicating that they are correctly placed. When placed properly, the shape hints in the beginning keyframe turn yellow and those in the ending keyframe turn green.

10 Scrub the playhead through the first shape tween on the Timeline to see the effect of the shape hints on the shape tween.

The shape hints force the tip of the flame in the first keyframe to map to the tip of the flame in the second keyframe and force the bottoms to map to each other. This restricts the transformations.
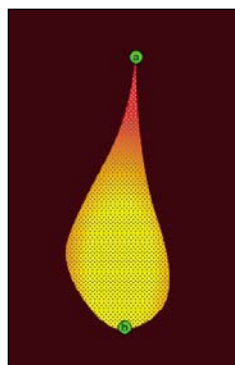
To demonstrate the value of shape hints, you can deliberately create a mess of your shape tweens. In the end keyframe, put the "b" hint at the top of the flame and the "a" hint at the bottom.
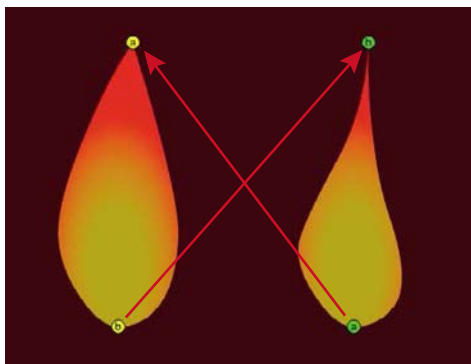
Beginning keyframe   Ending keyframe

Tip You can add a maximum of 26 shape hints to any shape tween . Be sure to add them consistently in a clockwise or counterclockwise direction for best results .

Animate forces the tip of the flame to tween to the bottom of the flame, and vice versa. The result is a strange flipping motion as Animate tries to make the transformation. Put the "a" back at the top and the "b" back at the bottom after you're done experimenting.

Removing shape hints

If you've added too many shape hints, you can easily delete the unnecessary ones. Removing a shape hint in one keyframe will remove its corresponding shape hint in the other keyframe.

• Drag an individual shape hint entirely off the Stage and pasteboard.

• Choose Modify > Shape > Remove All Hints to delete all the shape hints.

Only the content in the keyframes of a shape tween is displayed fully rendered. All other frames are shown as outlines. To see all frames fully rendered, use onion skinning, as described in the next exercise.

Previewing Animations with Onion Skinning

It's sometimes useful to see how your shapes are changing from one keyframe to another on the Stage all at once. Seeing how the shapes gradually change lets you make smarter adjustments to your animation. You can do so using the onion skinning option, available at the bottom of the Timeline.

Onion skinning shows the contents of the frames before and after the currently selected frame.

The term "onion skin" comes from the world of traditional hand-drawn animation, in which animators draw on thin, semitransparent tracing paper known as onionskin. A light box shines a light behind the drawings to allow them to be seen through several sheets. When creating an action sequence, animators flip back and forth quickly between drawings held between their fingers. This allows them to see how the drawings smoothly connect to each other.

Turning on onion skinning

There are two modes for onion skinning: Onion Skin and Onion Skin Outlines. Although both show previous and future frames, Onion Skin displays graphics fully rendered, whereas Onion Skin Outlines shows only the outlines of your graphics. In this task, you'll use Onion Skin Outlines.

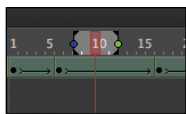**1** Click the Onion Skin Outlines button at the bottom of the Timeline.

Animate shows several outlines of the flame, with the currently selected frame in red. The previous two frames are shown in blue, and the future two frames

are shown in green. The outlines of the flame fade the farther away they are from the current frame.
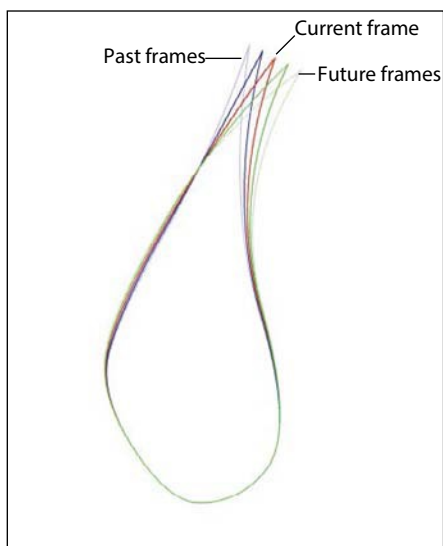
On the Timeline, Animate displays markers to bracket your currently selected frame. The blue-marked bracket (to the left of the playhead) indicates how many previous frames are shown on the Stage, and the green-marked bracket (to the right of the playhead) indicates how many future frames are shown.


2 Move the playhead to a different frame.

Animate keeps the markers around the playhead no matter where you move it, always showing the same number of frames behind and ahead.

3 Click the Onion Skin button at the bottom of the Timeline.

Onion skinning switches from Outlines mode to the standard Onion Skin mode, showing the onion skins of your flame fully rendered. The flames from previous frames are tinted blue, and the flames from future frames are tinted green.
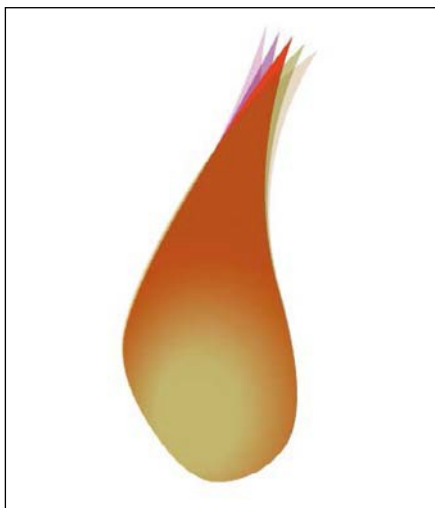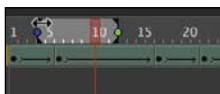
Adjusting the markers

You can move either marker to show more or fewer onion skin frames.

*   Drag the blue marker to adjust the number of past onion skin frames shown.

*   Drag the green marker to adjust the number of future frames displayed.
*   Hold down the Ctrl/Command key while dragging either marker to move the past and future markers in equal amounts.
*   Hold down the Shift key while dragging either marker to move the onion skin range to a different spot on the Timeline (as long as it still encompasses the playhead).
*   Click the Modify Markers menu button to select a preset marker option. For example, you can choose Marker Range 2 or Marker Range 5 to have the markers show two or five frames, respectively, in front of and behind the current frame.
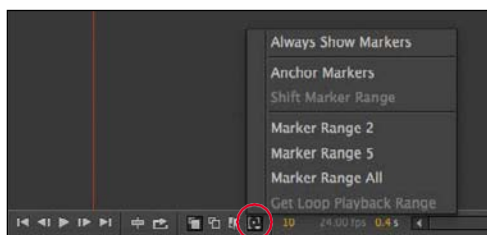
Customizing onion skin colors

If you don't like the green and blue color coding of previous and future frames, you can change them in the preferences.

1 Choose Edit > Preferences (Windows) or Animate CC > Preferences (Mac).

   The Preferences dialog box appears.

2 In the Onion Skin Color section, click the color boxes for Past, Present, or Future to choose new colors.

3 Click OK. Deselect the Onion Skin or Onion Skin Outlines button to return to the default view.
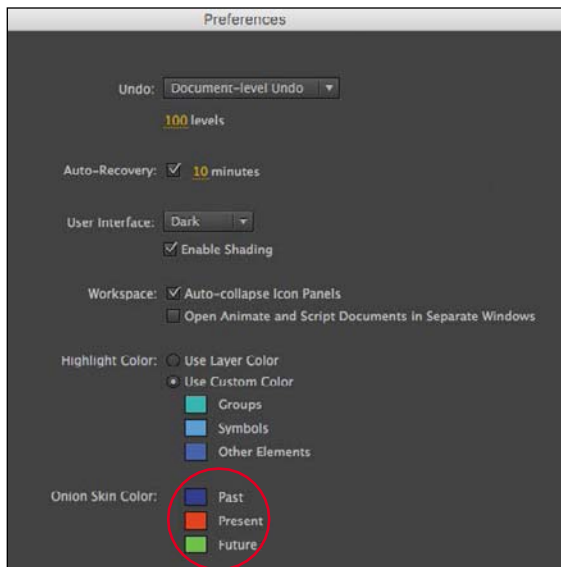
Animating Color

Shape tweens interpolate all aspects of a shape, which means that both the stroke and fill of a shape can be tweened. So far, you've modified the stroke, or outlines, of the flame. In the next section, you'll modify the fill so that the color gradient can change—perhaps glow brighter and more intensely at some points in the animation.

Adjusting the gradient fills

Use the Gradient Transform tool to change the way the color gradient is applied to a shape, and use the Color panel to change the actual colors used in a gradient.

1 If you're not already in symbol-editing mode for your flame symbol, double-click the flame movie clip symbol in the library to edit it.

2 Select the second keyframe on the flame layer (frame 6).

3 Select the Gradient Transform tool, which is grouped with the Free Transform tool in the Tools panel.

The control points for the Gradient Transform tool appear on the gradient fill of the flame. The various control points allow you to stretch, rotate, and move the focal point of the gradient within the fill.


Focal point

Center point

Width

Size

Rotation
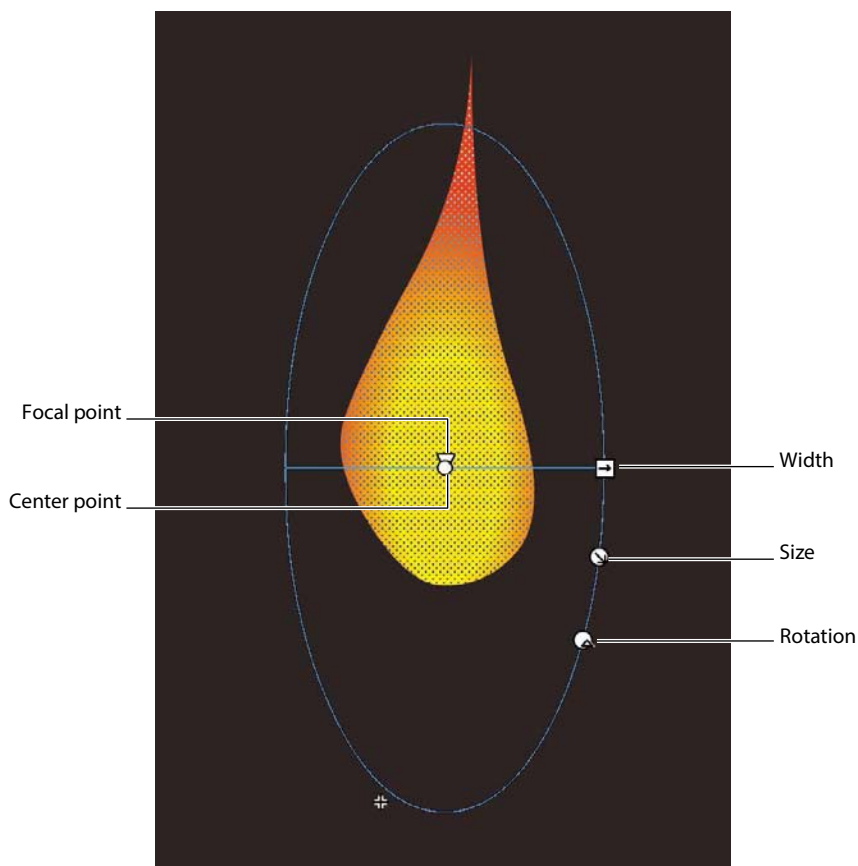
4 Use the control points to tighten the color gradient into the base of the flame. Reduce the gradient's size, make it wider, position it lower on the flame, and move the focal point (represented by a tiny triangle) of the gradient to one side.
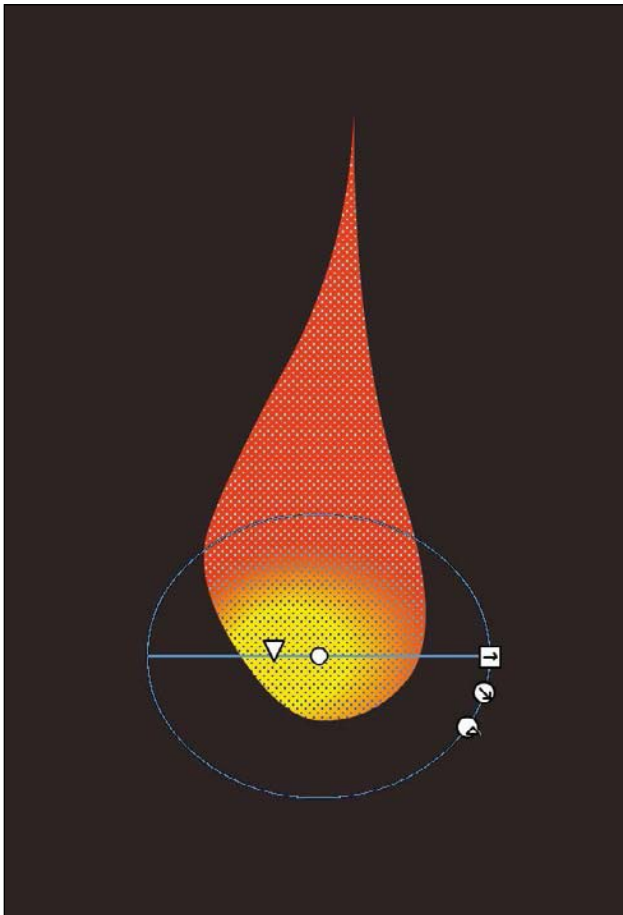
Your flame's orange core appears lower and more intense because the colors are distributed in a smaller area.

5 Move the playhead along the Timeline between the first and second keyframe.

The shape tween automatically animates the colors inside the flame as well as its contours.

6 Select the third keyframe on the flame layer (frame 17). In this frame, you'll adjust the actual color of the gradient.
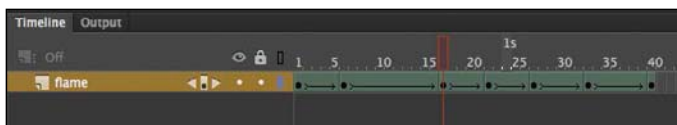
7 Select the Selection tool and click the fill of the flame on the Stage.
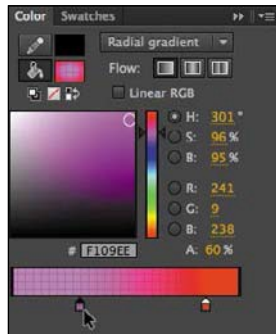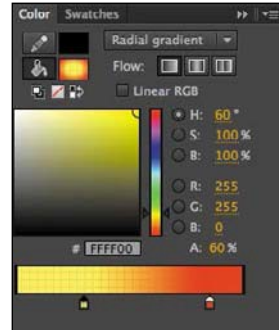
8 Open the Color panel (Window > Color).

The Color panel appears, showing you the gradient colors of the selected fill.

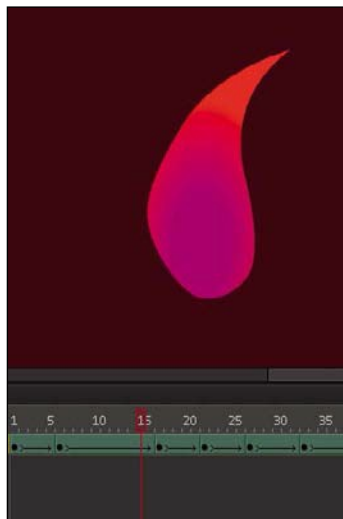**9** Click the inner color marker, which is currently yellow.

10 Change the color to a hot pink (#F109EE).

The center color of the gradient turns pink.

11 Move the playhead along the Timeline between the second and third keyframes.

The shape tween automatically animates the center color in the gradient from yellow to pink. Experiment with the other keyframes by modifying the gradient fill and see what kinds of interesting effects you can apply to your flickering flame.

Creating and Using Masks

Masking is a way of selectively hiding and displaying content on a layer. It enables you to control the content that your audience sees. For example, you can make a circular mask and allow your audience to see only through the circular area so that you get a keyhole or spotlight effect. In Animate, you put a mask on one layer and the masked content in a layer below it.

For the animated logo you're creating in this lesson, you'll make the text a little more visually interesting by using the text itself as a mask.
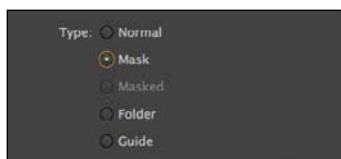
Define the mask layer

You'll create from the "Fire starter" text a mask that will reveal an image of a fire beneath it.

1 Return to the main Timeline. Unlock the text layer. Double-click the icon in front of the text layer name, or select the text layer and choose Modify > Timeline > Layer Properties.
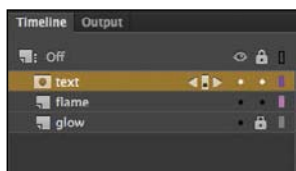
The Layer Properties dialog box appears.
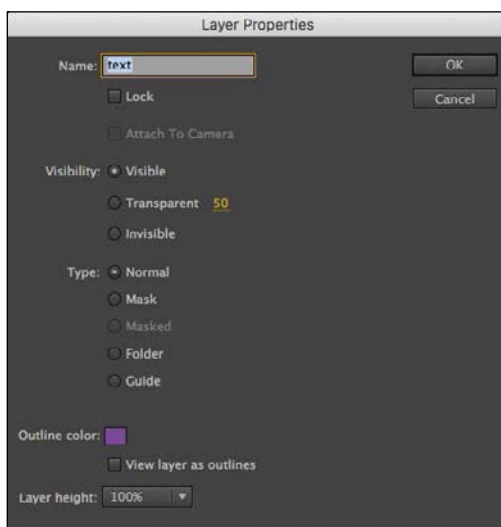
2 Select Mask and click OK.

The text layer becomes a mask layer, indicated by the mask icon in front of the layer name. Anything in this layer will act as a mask for a masked layer below it.

For this lesson, we're using the text already in place as the mask, but the mask can be any filled shape. The color of the fill doesn't matter. What's important to Animate are the size, location, and contours of the shape. The shape will be the "peephole" through which you'll see the content on the layer below. You can use any of the drawing or text tools to create the fill for your mask.
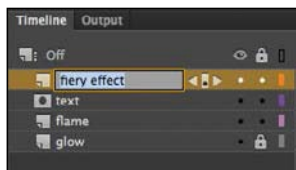
Create the masked layer

The masked layer is always under the mask layer.

1   Click the New Layer button, or choose Insert > Timeline > Layer.

    A new layer appears.

2   Rename the layer **fiery effect**.

3   Drag the fiery effect layer under the mask layer (named "text") and a little to the right so that it becomes indented.

    The fiery effect layer becomes a masked layer, paired with the mask layer above it. Any content in the masked layer will be masked by the layer above it.
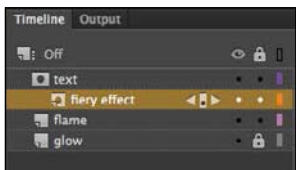
4   Choose File > Import > Import To Stage, and select fire.jpg from the 08Start folder.

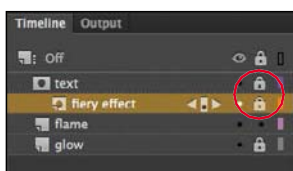The bitmap image of fire appears on the Stage, and the words appear over the image.

See the effects of the mask

To see the effects of the mask layer on its masked layer, lock both layers.

1 Click the Lock option for both the text layer and the fiery effect layer.

Both mask and masked layers become locked. The shapes of the letters in the mask layer reveal parts of the image in the masked layer.

2 Choose Control > Test.

As the flame flickers above the text, the letters reveal the fiery texture in the layer below it.

Animating the Mask and Masked Layers

The letters of your animated logo have more drama now that you've created a mask with an image of fire behind it. However, the client for this fictional project now demands that it have even more punch. Although she likes the look of the fiery letters, she wants an animated effect.

Fortunately, you can include animations in either the mask or the masked layer. You can create an animation in the mask layer if you want the mask itself to move or expand to show different parts of the masked layer. Or you can create an animation in the masked layer if you want the content to move under a mask, like scenery whizzing by a train window.

## Adding a tween to the masked layer

To make the logo more compelling for your client, you'll add a shape tween to the masked layer. The shape tween will move a glow from left to right for a portion of the movie under the letters.

1 Unlock both the text layer and the fiery effect layer.

   The effects of the mask and masked layer are no longer visible, but their contents are now editable.

2 Delete the bitmap image of the fire in the fiery effect layer.

3 Choose the Rectangle tool and open the Color panel (Window >Color).

4 In the Color panel, make sure Fill Color is selected and choose Linear Gradient from the Color Type menu.

5 Create a gradient that starts with red on the far left (#FF0000), goes to yellow in the middle (#FFFC00), and becomes red again on the far right (#FF0000). Make sure your Alpha settings are at 100% so that the colors are not transparent.
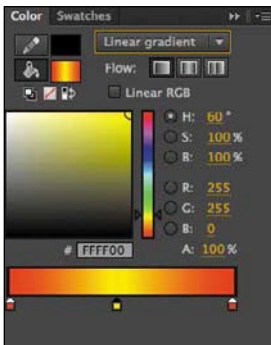

6 Create a rectangle in the fiery effect layer that encompasses the letters in the text layer.

7 Choose the Gradient Transform tool, and click the fill of your rectangle to select it.

The control handles for the Gradient Transform tool appear on the fill of the rectangle. We'll use this tool to position the gradient off the Stage so it can make a dramatic entrance.
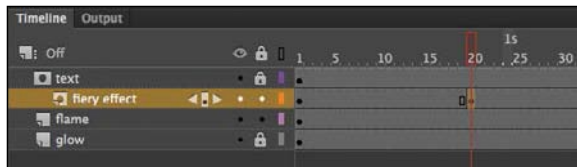
8 Drag the center point of the gradient so that the yellow color appears on the far left side of the Stage.
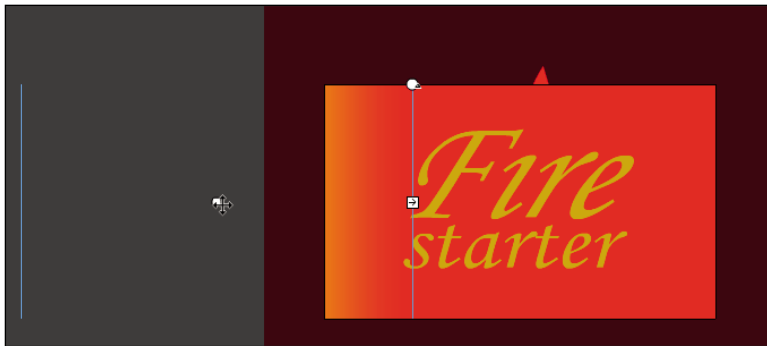
The yellow glow will enter from the left and move to the right.

9 Right-click frame 20 in the fiery effect layer and choose Insert Keyframe (F6).

The contents of the previous keyframe are copied into the new keyframe.

10 Right-click the last frame (frame 40) in the fiery effect layer and choose Insert Keyframe (F6).

The contents of the keyframe at frame 20 are copied into the new keyframe. You now have three keyframes in the fiery effect layer.


11 Make sure that your playhead is still in the last frame (frame 40).

12 Drag the center point of the gradient far enough to the right so that the yellow color is just barely visible on the right side of the Stage.

13 Right-click anywhere on the Timeline between the second and third keyframe in the fiery effect layer, and select Create Shape Tween. Or, from the top menu, choose Insert > Shape Tween.

The color gradient is shape tweened so that the yellow glow moves within the fill of the rectangle from left to right.
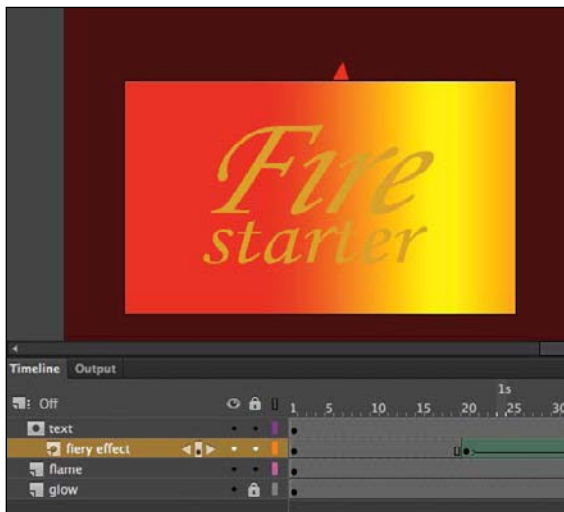
14 Watch your animation by choosing Control > Test.

While the flame burns above the letters, a soft yellow glow flashes across the letters.


Easing a Shape Tween

Eases help your animation bear a sense of weight by enabling you to add an acceleration or deceleration component to its motion.

You add an ease to a shape tween in the Properties panel. Ease values range from −100, which indicates an ease-in, to 100, which indicates an ease-out. An ease-in makes the motion start off slowly. An ease-out slows down the motion as it approaches its end keyframe.

Adding an ease-in

You'll make the glow that flashes across the letters of the logo begin slowly and then pick up speed. The ease-in will help viewers take notice of the animation before it proceeds.

1 Click anywhere inside the shape tween in the fiery effect layer.

2 In the Properties panel, enter -**100** for the Ease value.
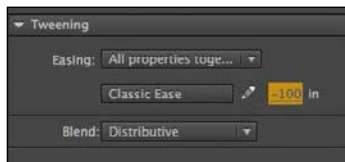
Animate applies an ease-in effect to the shape tween.

3 Make sure your mask and masked layers are locked, and choose Control > Test to test your movie.

The soft yellow glow flashes across the letters, starting off slowly and then adding a little more sophistication to the entire animation.