

# 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 nested animation
- Split a motion tween
- Change the easing of an object's motion
- Animate in 3D space



This lesson will take about two hours to complete. Please log in to your account on [peachpit.com](https://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.”



Use Adobe Animate CC 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.

● **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.

## Getting Started

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.mp4 file in the Lesson04/04End folder to play the final animation, which was exported as a video file.



The project is an animated opener that would be placed on a website 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.mp4 file.
- 3 Double-click the 04Start.fla file in the Lesson04/04Start folder to open the initial project file in Animate. This file is an ActionScript 3.0 document that is partially completed and already contains many of the graphic elements imported into the library for you to use. You’ll use all the animation functionality available in an ActionScript 3.0 document, but instead of using the Flash Player for playback in a browser, you’ll export an MP4 video file.
- 4 From the view options above the Stage, choose Fit In Window, or choose 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 rotation, or 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 Animate, the basic workflow for animation goes like this: Select an object on the Stage, right-click, and choose Create Motion Tween from the context menu. Move the red playhead to a different point in time and move the object to a new position or change one of its properties. Animate takes care of the rest by smoothly interpolating the changes between the two points in time.

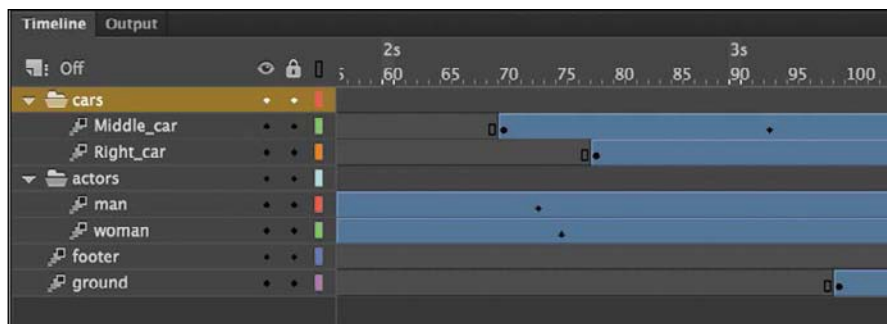
*Motion tweens* create animation for changes in position on the Stage and for changes in size, color, or other attributes. Motion tweens require you to use a symbol instance. If the object you've selected is not a symbol instance, Animate will automatically ask to convert the selection to a symbol.

Animate also automatically separates motion tweens onto their own layers, which are called tween layers. There can be only one motion tween per layer, and there can be no other element on 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.

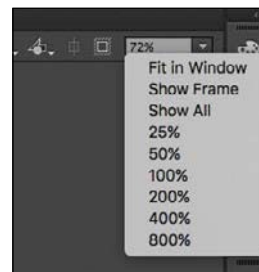
The term “tween” comes from the world of classic animation. Senior animators would be responsible for drawing the beginning and ending poses for their characters. The beginning and ending poses were the keyframes of the animation. Junior animators would then come in and draw the “in-between” frames, 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.



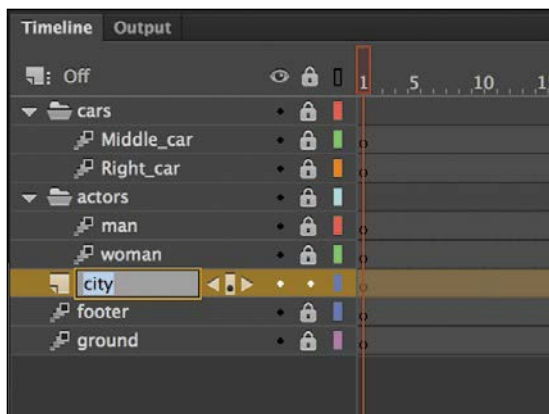
You'll be adding more layers to create an animated cityscape, refining the animation of one of the actors and adding a third car and a 3D title. All the necessary graphic elements have been imported into the library. The Stage is set at 1280 pixels by 787 pixels, and the Stage color is black. You might 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 upper-right corner of the Stage, to view the Stage at a magnification percentage that fits your screen.



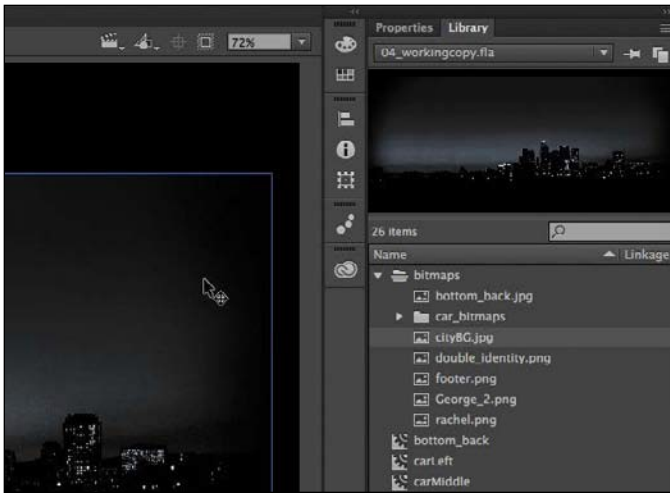
## Animating Position

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.

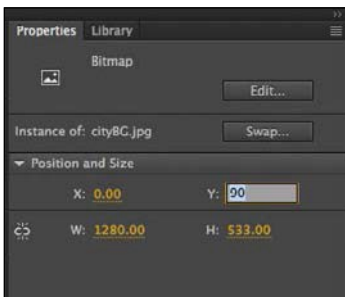
- 1 Lock all the existing layers so you don't accidentally modify them. Create a new layer above the footer layer and rename it **city**.



- 2 Drag the bitmap image called cityBG.jpg from the bitmaps folder in the Library panel to the Stage.

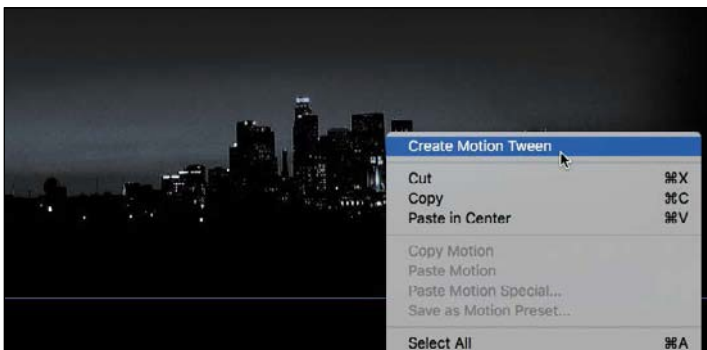


- 3 In the Properties panel, set the value of X to 0 and the value of Y to 90.

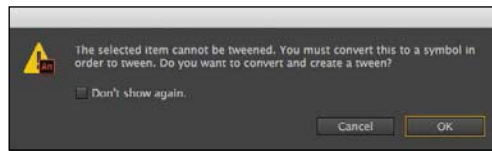


This positions the cityscape image just slightly below the top edge of the Stage.

- 4 Right-click the cityscape image and choose Create Motion Tween, or choose Insert > Motion Tween.



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



Animate automatically converts your selection to

a symbol, with the default name **Symbol 1**, and stores it in your Library panel. Animate 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. The range of frames covered by the tween is the *tween span*. The tween span is represented by all the colored frames from the first keyframe to the last keyframe. Tween layers are reserved for motion tweens; hence, no drawing is allowed on a tween layer.



- 6 Move the red playhead to the end of the tween span, at frame 191.
- 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.

- 8 For more precision, set the value of Y to 0 in the Properties panel.

A small black diamond appears in frame 191 at the end of the tween span. This indicates a keyframe at the end of the tween.



Animate smoothly interpolates the change in position from frame 1 to frame 191 and represents that motion with a motion path on the Stage.



- 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 (or press Enter/Return) to make Animate play the animation.

Animating changes in position is simple because Animate 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. Animate takes care of the rest.

## Preview the animation

Integrated into the bottom of the Timeline is a set of playback controls. These controls allow you to play, rewind, or go step by step backward or forward through your Timeline to review your animation in a controlled manner. You can also use the playback commands on 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.

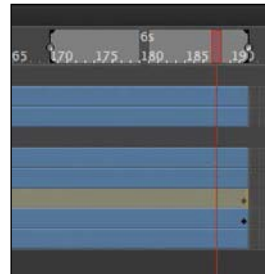


- 2 Select Loop option (to the right of the controller), and then click the Play button.

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

- 3 Move the start or end markers in the Timeline header to define the range of frames that you want to see looped.

The playhead loops within the marked frames. Click Loop Option again to turn it off.



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

**Tip** Remove a motion tween by right-clicking the motion tween on the Timeline or the Stage and choosing Remove Tween.

**Tip** You can also use the Time Scrub tool (hidden under the Hand tool) to move back and forth on the Timeline to preview your animation. Choose the Time Scrub tool (or hold down Spacebar+T) and drag back and forth on the Stage.

## Changing the Pacing and Timing

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

### Changing the animation duration

If you want the animation to proceed at a slower pace (and thus take 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 its ends on the Timeline.



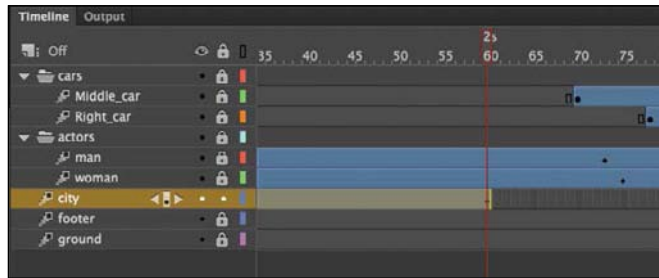
- 1 Move your mouse pointer close to the end of the tween span in the city layer.

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

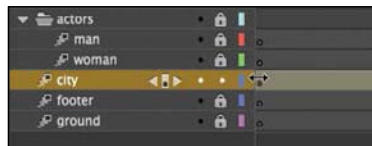


- 2 Drag the end of the tween span back to frame 60.

Your motion tween shortens to 60 frames, reducing the time it takes the cityscape to move.



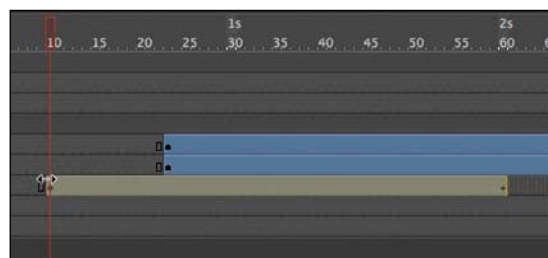
- 3 Move your mouse pointer close to the beginning of the tween span (at frame 1).



- 4 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.

● **Note** If you have multiple keyframes in a tween, changing the length of the tween span by dragging one end or the other will distribute all your keyframes uniformly. The timing of your entire animation remains the same; only the length changes.

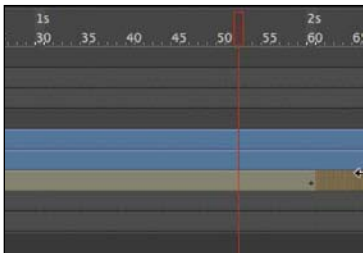


## Adding frames

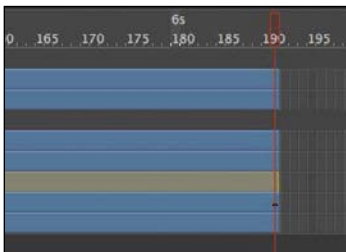
You'll want the last keyframe of your motion tween to hold for the remainder of the animation. Add frames by Shift-dragging the end of a tween span.

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

- 2 Hold down the Shift key and drag the end of the tween span forward to frame 191.



The last keyframe in the motion tween remains at frame 60, but Animate adds frames through frame 191.



**Tip** 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

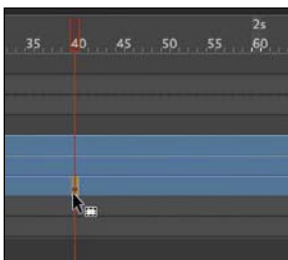
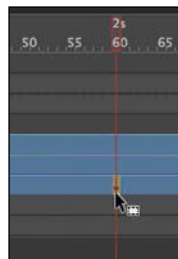
If you want to change the pacing of an animation, you can select individual keyframes and then drag them to new positions.

- 1 Click the keyframe at frame 60.

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

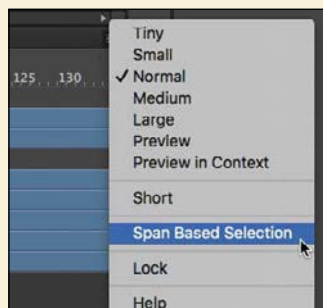
- 2 Drag the keyframe to frame 40.

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



## Span-based vs. frame-based selection

By default, Animate uses frame-based selection, which means you can select individual keyframes within a motion tween. However, if you prefer to click 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 upper-right corner of the Timeline (or you can Shift-click to select the entire span).



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/Command key and click a keyframe.

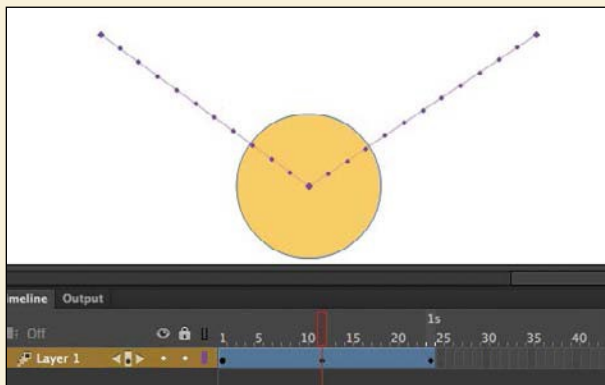
## Moving keyframes vs. changing time in tween spans

Managing the timing of your animation by moving keyframes and stretching or squashing tween spans can sometimes be frustrating because you will get different outcomes depending on what you've selected on the Timeline and how you drag those selections.

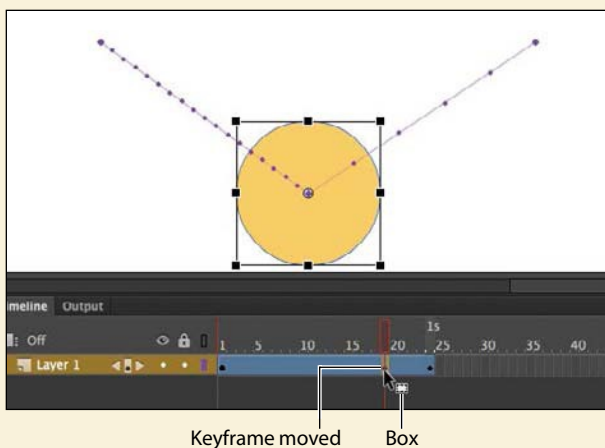
If you want to simply move the location of a keyframe within a tween span, make sure that only a single keyframe is selected, and that the tiny box appears next to your mouse cursor before you begin dragging the keyframe to a new location.

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

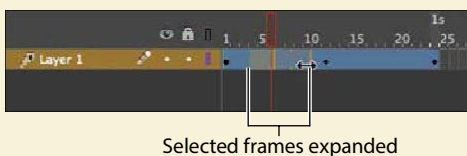
Consider the following animation, where a ball moves from the left side of the Stage to the bottom edge and then to the right side, making a figure "V." On the Timeline, three keyframes mark the three positions of the ball.

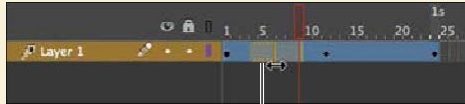


Moving the middle keyframe changes the timing of when the ball hits the bottom of the Stage .

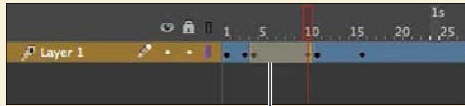


When you select a span of frames within a tween, you can compress or expand its duration by dragging the selection when the double-headed arrow appears near the right edge of the selection.



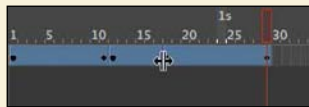


Selected frames compressed



Final result: motion tween split

Finally, a double-headed arrow with a vertical break indicates that you can change the position of the separation between two different tweens .



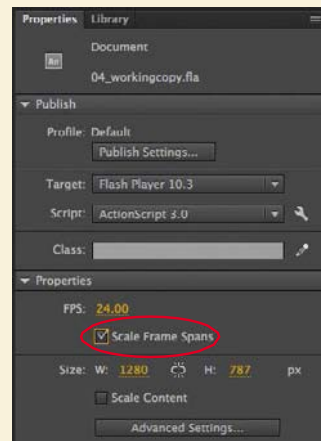
## Understanding frame rate

The speed of your animation is tied to the frame rate of your document (shown in the Properties section of the Properties panel), but do *not* modify the frame rate in order to change the speed or duration of your animation .

The frame rate determines how many frames on the Timeline make up one second . The default is 24 frames per second (fps) . The seconds are marked on the Timeline . Frame rate is a measure of how smooth an animation appears—the higher the frame rate, the more frames there are to show the action . Animations at slower frame rates appear choppy because there are fewer frames to show the action . Slow-motion videography depends on very high frame rates in order to capture action that happens very quickly, such as a speeding bullet or a falling water droplet .

If you want to modify the overall duration or speed of your animation, don't change the frame rate . Instead, add or delete frames from your Timeline .

If you want to change the frame rate but keep the overall duration constant, select the Scale Frame Spans option in the Properties panel before you modify the frame rate .

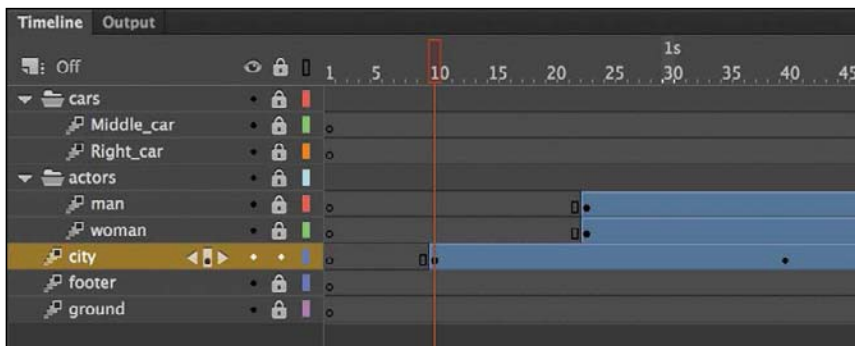


# Animating Transparency

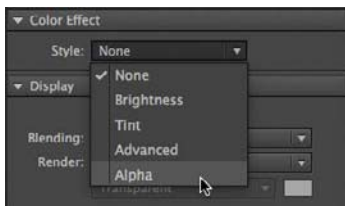
In the previous lesson, you learned how to change the color effect of any symbol instance to change the transparency, tint, or brightness. You can change the color effect of an instance in one keyframe and change the value of the color effect in another keyframe, and Animate will automatically display 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. Animate will create a smooth fade-in effect.

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



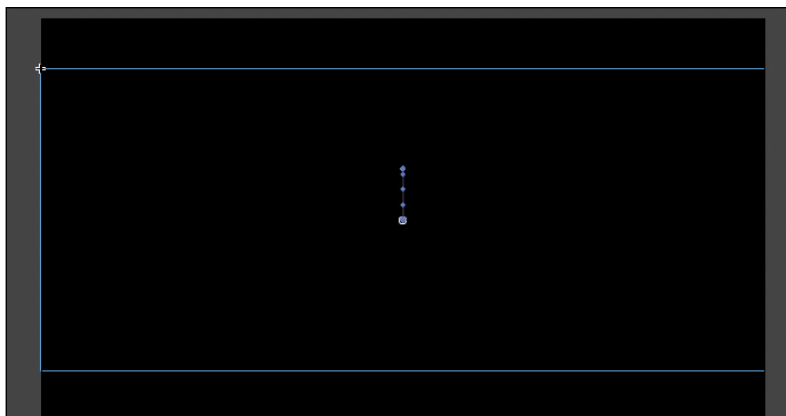
- 2 Select the cityscape instance on the Stage.
- 3 In the Color Effect section of the Properties panel, choose Alpha from the Style menu.



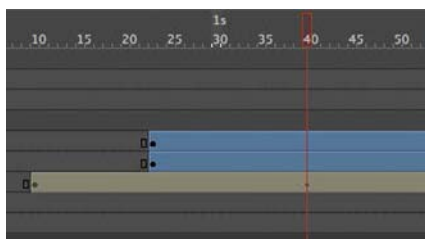
- 4 Set the Alpha value to 0%.



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 Make sure that the cityscape instance on the Stage is still selected.
- 7 In the Properties panel, in the Color Effect section, set the Alpha value to **100%**.  
The cityscape instance on the Stage becomes totally opaque.



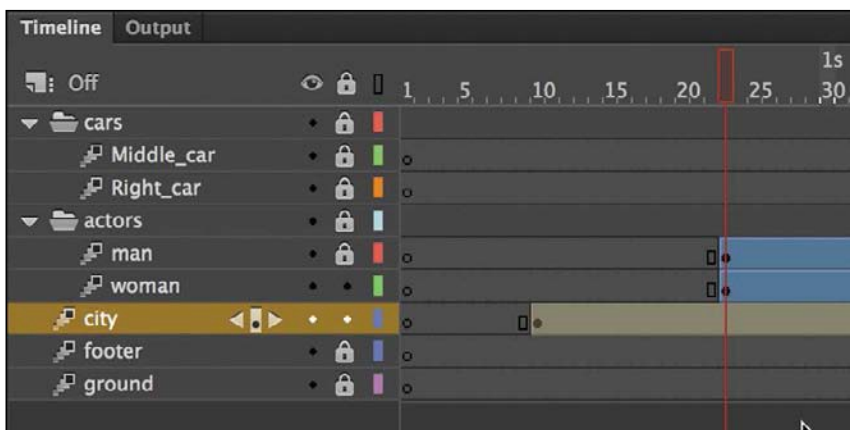
- 8 Preview the effect by choosing **Control > Play** (or pressing **Enter/Return**).  
Animate interpolates the changes in both position and transparency between the two keyframes.

# Animating Filters

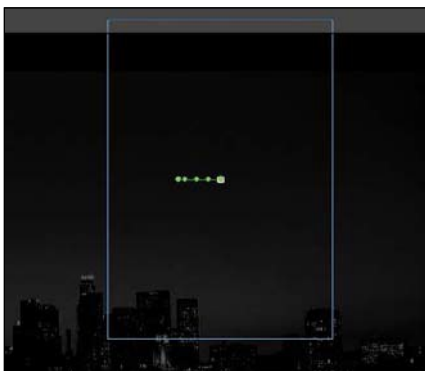
Filters, which give instances special effects such as blurs and drop shadows, can also be animated. You'll next refine the motion tween of the actors by applying a blur filter to one of them to make it appear as if the camera changes focus. Animating filters is no different from animating changes in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

● **Note** Filters can not be animated in an HTML5 Canvas document .

- 1 Make sure that the actors layer folder on the Timeline is visible.
- 2 Unlock 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). Click the upper-right side of the Stage to select the transparent instance. Or, click the woman layer in the Timeline to highlight it; then click within the outline that appears on the Stage.





5 In the Properties panel, expand the Filters section.

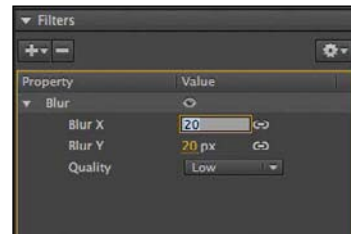
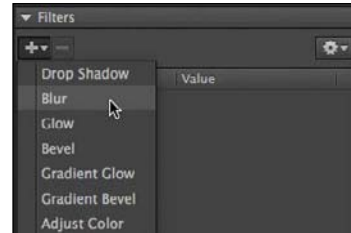
6 Click the Add Filter (+) button in the Filters section, and choose Blur from the menu to add a blur to the instance.

7 In the Filters section of the Properties panel, make sure that the link icons are selected in order to apply equal values to the *x* and *y* directions. Set the Blur X value to 20 pixels.

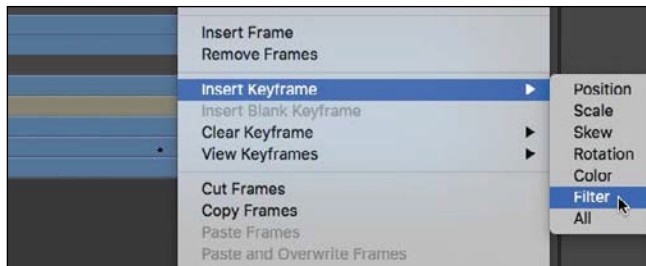
The Blur Y value also changes to 20 pixels.

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

The woman instance is blurred throughout the motion tween.

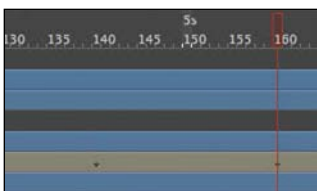


9 Right-click the woman layer at frame 140, and choose Insert Keyframe > Filter.



Animate establishes a keyframe for filters at frame 140.

- 10 Move the red playhead to frame 160, right-click the woman layer, and choose Insert Keyframe > Filter to add another filter keyframe.



- 11 Select the instance of the woman on the Stage at frame 160.
- 12 In the Properties panel, change the value of the Blur filter to X=0 and Y=0.

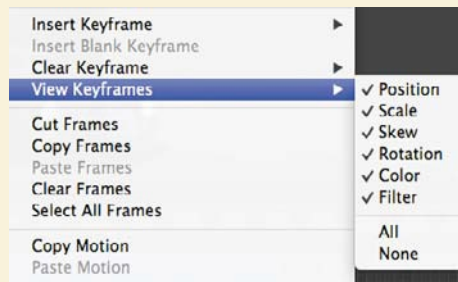
The Blur filter changes from the keyframe at frame 140 to the keyframe at 160. Animate creates a smooth transition from a blurry instance to an in-focus instance.



## 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, Animate CC 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 so that you can see when your object moves. Or, you can choose to view only the Filter keyframes so that you can see when a filter changes. Right-click a motion tween in the Timeline, choose View Keyframes, and then select the desired property from the list. You can also choose All or None to see all the properties or none of the properties.



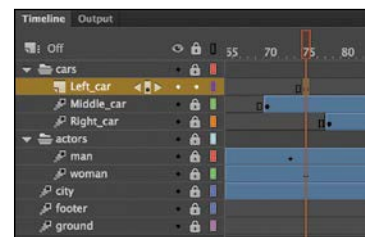
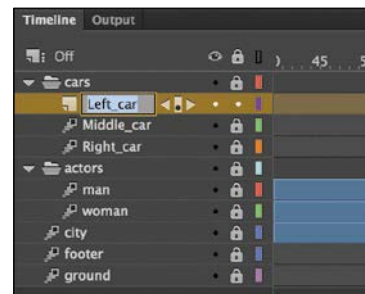
When inserting a keyframe, you can also insert a keyframe specific to the property you want to change. Right-click a motion tween in the Timeline, choose Insert Keyframes, and then select the desired property.

You can also view an advanced panel, called the Motion Editor, to see and edit how the different properties of your object change over the course of the motion tween. You'll learn more about the Motion Editor in the next lesson.

## Animating Transformations

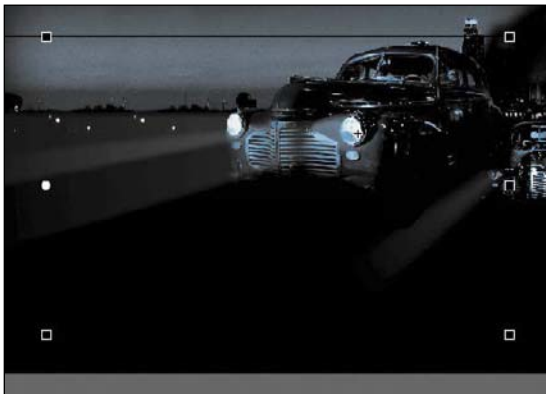
Now you'll learn how to animate changes in scale or rotation. These kinds of changes are made with the Free Transform tool or with the Transform panel. You'll add a third car to the project. The car will start small, and then become larger as it appears to move forward toward the viewer.

- 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, drag a corner handle inward to make the car smaller.
- 7 In the Properties panel, make sure that the width of the graphic is about 400 pixels.

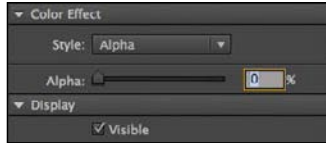
Alternatively, you can use the Transform panel (Window > Transform) and change the scale of the car to about **29.4%**.

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



- 9 In the Properties panel, in the Color Effect section, choose Alpha from the Style menu.

- 10** Set the Alpha value to 0%.

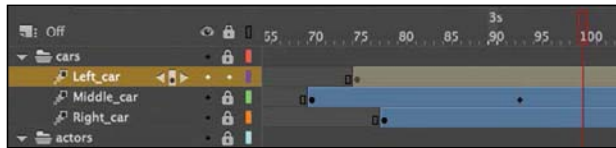


The car becomes totally transparent.

- 11** Right-click the car on the Stage and choose Create Motion Tween.

The current layer becomes a tween layer.

- 12** Move the red playhead on the Timeline to frame 100.

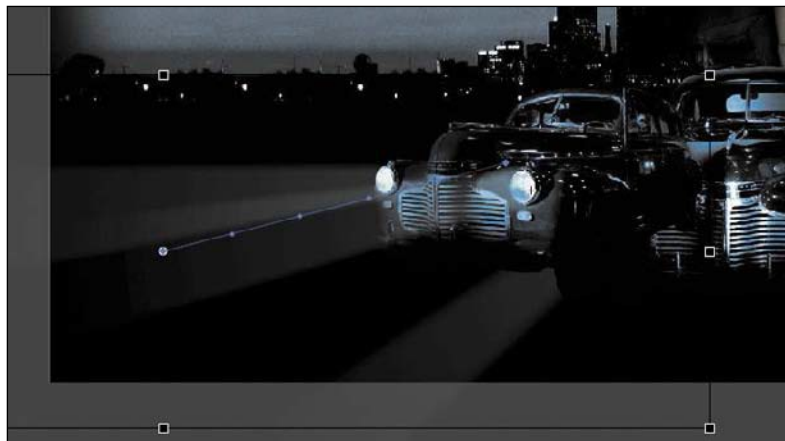


- 13** Select the transparent instance of the car on the Stage, and in the Properties panel, change the Alpha value to 100%.

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

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


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



You have used Animate to tween the change in position and the change in scale as well as the change in transparency from frame 75 to frame 100.

- 16 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.



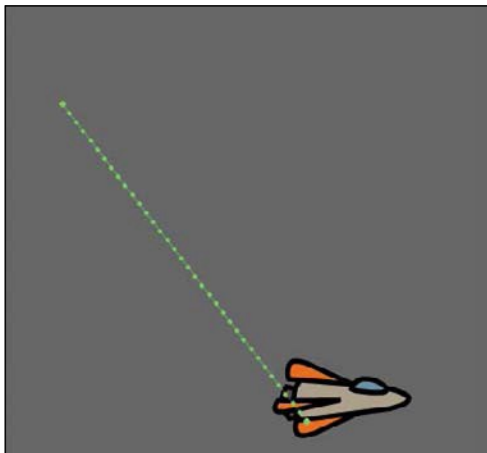
 **Tip** Holding down the Alt/Option key while dragging one corner handle of the bounding box causes the box to resize relative to the opposite corner rather than relative to the object's transformation point (usually the center).

Save your progress so far in this document, **04\_workingcopy.fla**. In the next section, you'll work with a different file.

## 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. You can easily edit the path of the motion to make the car travel in a curve, or you can move, scale, or rotate the path 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 in the Lesson04/04Start folder. The file contains a single tween layer with a rocket ship moving from the top left of the Stage toward the bottom right.

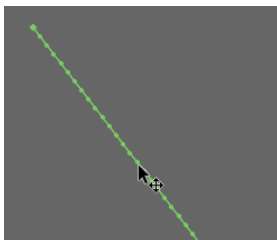


## Moving the path of the motion

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

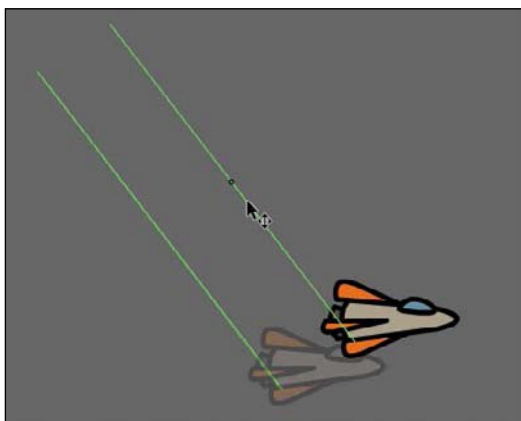
- 1 Select the Selection tool.
- 2 Click the path of the motion to select it.

The path of the motion becomes highlighted.



- 3 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.

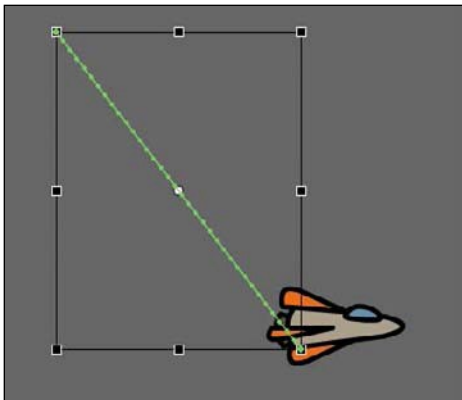


## Changing the scale or rotation of the path

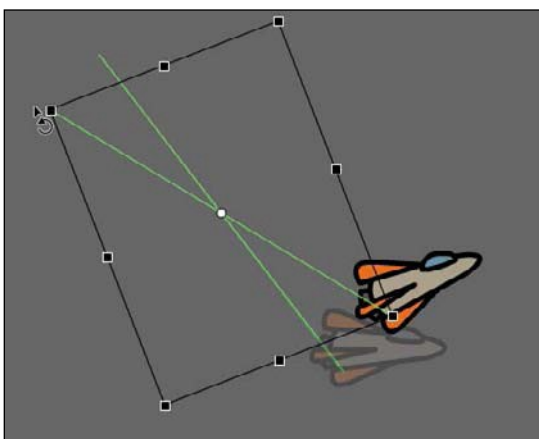
You can also manipulate the path of the object's motion using the Free Transform tool.

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

Transformation handles appear around the path of the motion.



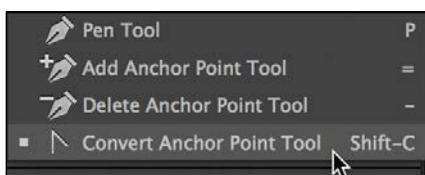
- 3 Scale or rotate the path of the motion as desired. You can make the path smaller or larger, or rotate the path so that the rocket ship starts from the bottom left of the Stage and ends at the top right.



## Editing the path of the motion

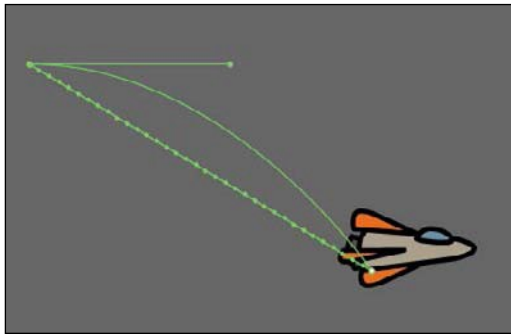
Making your objects travel on a curved path is a simple matter. You can edit the path with Bezier precision using anchor point handles, or you can edit the path in a more intuitive manner with the Selection tool.

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





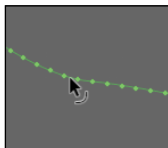
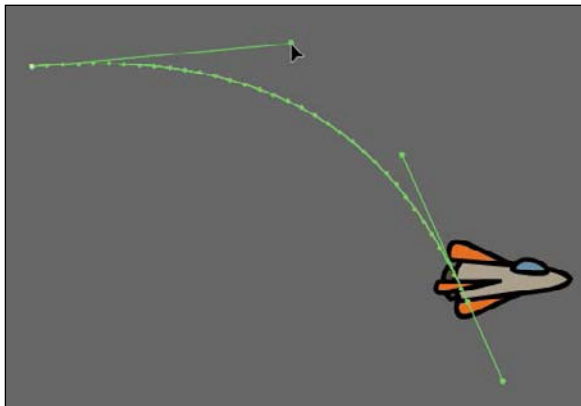
- 2 Click the starting point or the ending point of the motion path on the Stage, and drag the control handle out from the anchor point.



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

- 3 Select the Subselection tool.
- 4 Drag the handle at each end of the path to edit its curve. Make the rocket ship travel in a wide curve.

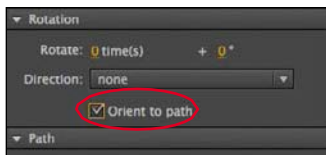
**Tip** You can also directly manipulate the path of the motion with the Selection tool. Select the Selection tool and make sure the path is deselected. Move your pointer close to the path of the motion. A curved icon appears next to your pointer, indicating that you can edit the path. Drag the path of the motion to change its curvature. Choose the spots where you drag carefully! Each drag breaks the path into smaller segments, making it harder to achieve a smooth curve. Mastery will come with practice.



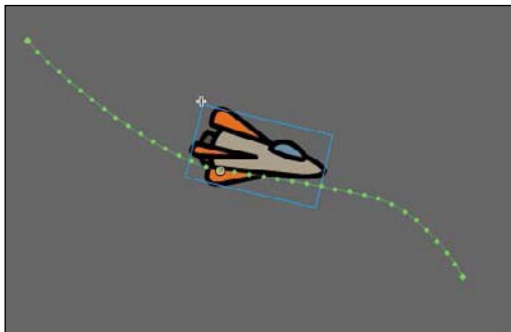
## Orienting objects to the path

Sometimes the orientation of the object traveling along the path is important. In the motion picture promotional project, the orientation of the car is constant as it moves 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. Orient To Path in the Properties panel gives you this option.

- 1 Select the motion tween on the Timeline (Shift-click to select the whole tween).
- 2 In the Properties panel, under Rotation, select the Orient To Path option.



Animate inserts keyframes for rotation along the motion tween to orient the nose of the rocket ship to the path of the motion.

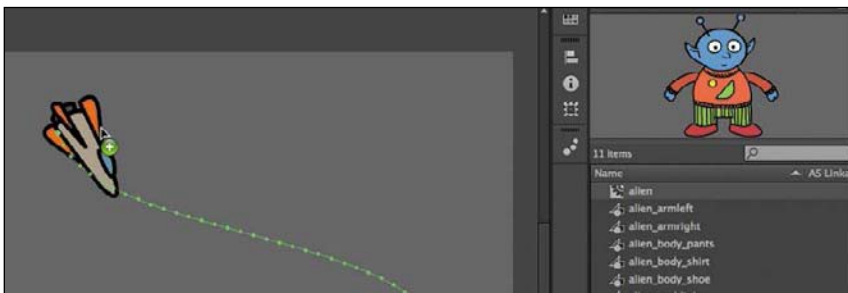


**Tip** To direct the nose of the rocket ship, or any other object, along the path of its motion, you must orient its position so that it is facing in the direction that you want it to travel. Use the Free Transform tool to rotate its initial position so that it is oriented correctly.

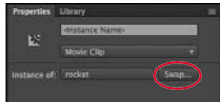
## Swapping Tween Targets

The motion tween model in Animate CC 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.

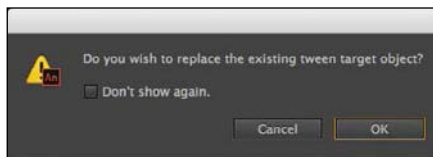


● **Note** You can also use the Properties panel to swap instances. Select the object that you want to swap on the Stage. In the Properties panel, click the Swap button. In the dialog box that appears, choose a new symbol and click OK. Animate will swap the target of the motion tween.



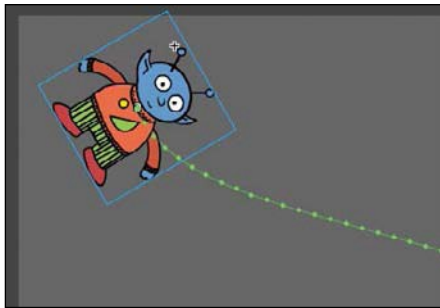
● **Note** If your symbol instance disappears from view after the symbol swap, choose View > Magnification > Show All (Ctrl+3/ Cmd+3) to change the zoom level to show all objects on the Stage.

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



2 Click OK.

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



## Creating Nested Animations

Often, an object that is animated on the Stage will have its own animation. For example, the wings of a butterfly moving across the Stage may flap 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 give the alien his own independent movement so he can wave as he flies across the Stage.

### Creating animations inside movie clip symbols

We'll animate some of the symbols that make up the alien's body to allow him to wave.

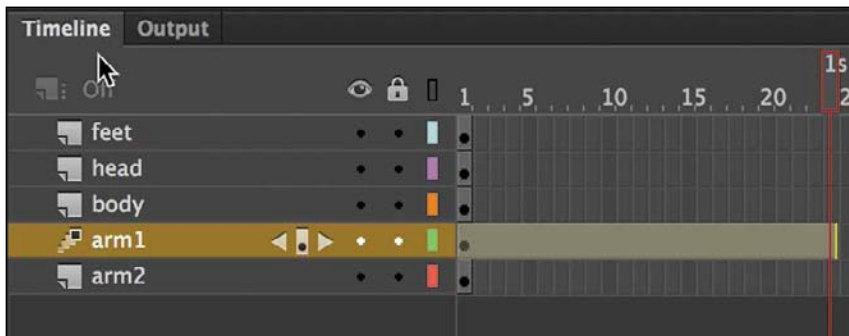
- 1 In the Library panel, double-click the alien movie clip symbol icon.

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.

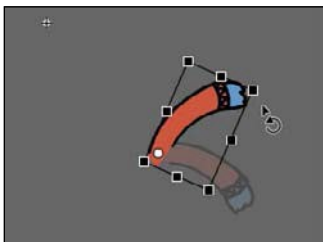
- 2 Select the Selection tool.
- 3 Right-click the alien's left arm and choose Create Motion Tween.



Animate converts the current layer into a tween layer and inserts 1 second's worth of frames so that you can begin to animate the instance.



- 4 Select the Free Transform tool.
- 5 Move the mouse pointer near the corner transformation handle until the cursor changes to the rotation icon. Drag the corner handle near the hand to rotate the arm upward to the alien's shoulder height.



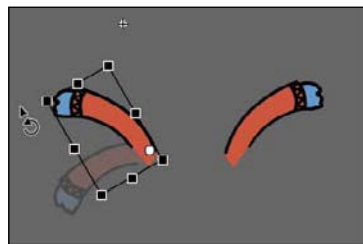
A keyframe is inserted at the end of the motion tween. The left arm rotates smoothly from the resting position to the outstretched position.

- 6 Move the red playhead back to frame 1.
- 7 Now create a motion tween for the alien's other arm. Right-click his right arm and choose Create Motion Tween.

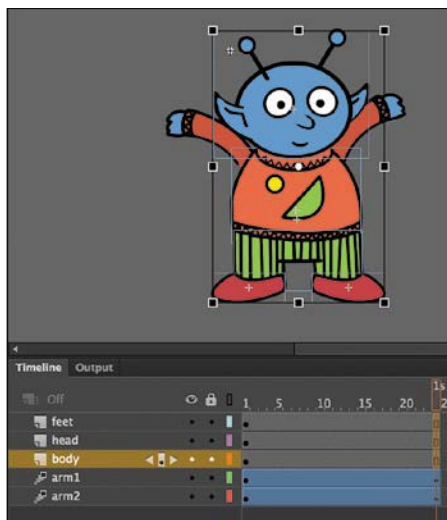
The current layer is converted into a tween layer, and 1 second's worth of frames are inserted.

- 8 Choose the Free Transform tool if it's not selected already.
- 9 As you did for the left arm, drag the corner transformation handle near the right hand to rotate the arm upward to the alien's shoulder height.

Animate 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.

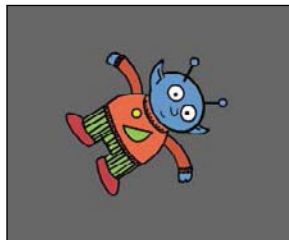


- 11 Click the Scene 1 button in the Edit bar at the top of the Stage to exit symbol-editing mode.

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

- 12 Preview the animation by choosing Control > Test.

Animate 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.



- 13 Save your project and close it. You'll return to your previous animation in the next section.

● **Note** Animations inside movie clip symbols won't play on the main Timeline. Choose Control > Test to preview nested animations .

● **Note** Animations inside movie clip symbols will loop automatically . To prevent the looping, you need to add code to tell the movie clip timeline to stop on its last frame. You'll learn to control those timelines with ActionScript or JavaScript in later lessons .

## 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.

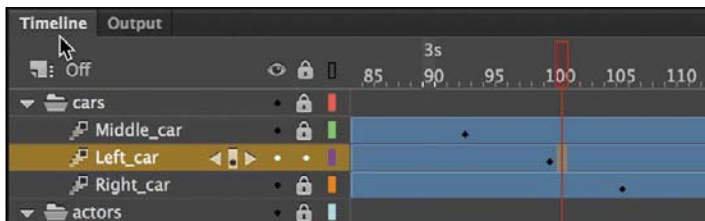
A simple way to apply easing to a motion tween is to use the Properties panel. Easing values range from -100 to 100. A negative value creates a more gradual change from the starting position (known as an ease-in). A positive value creates a gradual slowdown (known as an ease-out).

A more advanced way of applying eases to a motion tween is to use the new Motion Editor, which you'll learn about in the next lesson.

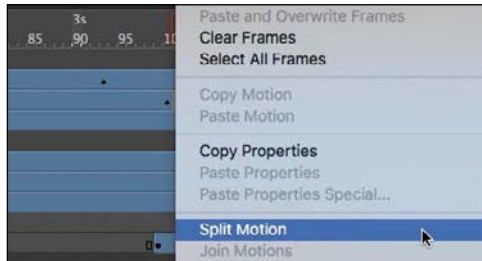
## Splitting a motion tween

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 191, 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 that you can apply an ease to the tween just from frame 75 to frame 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.

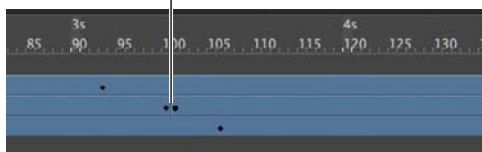


- 2 Right-click frame 101 and choose Split Motion.



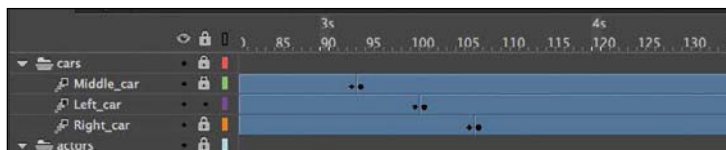
The motion tween is cut into two separate tween spans. The end of the first tween is identical to the beginning of the second tween.

Motion tween split



- 3 In the Middle\_car layer, select frame 94, right-click, and choose Split Motion to cut the motion tween into two separate tween spans.
- 4 In the Right\_car layer, select frame 107, right-click, and choose Split Motion to cut the motion tween into two spans.

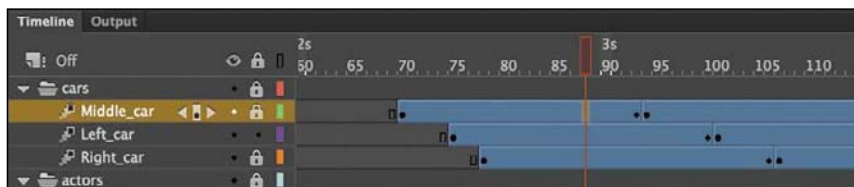
The motion tweens of all three cars have now been split.



## Applying eases to motion tweens

You'll apply an ease-in to the motion tweens of the approaching cars to give them a sense of weight and to make them 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).

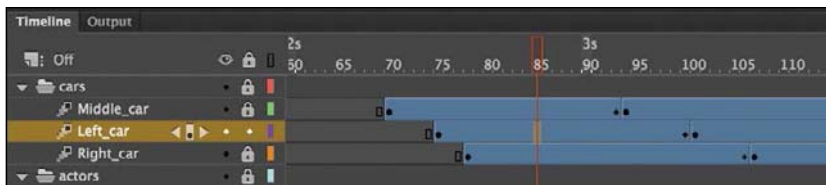


- 2 In the Ease section of the Properties panel, enter **100** for the Ease value.



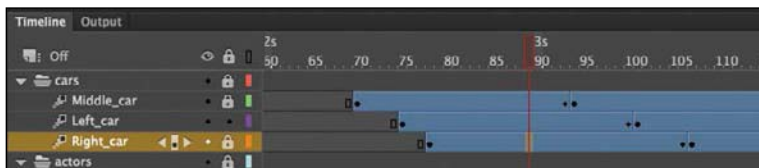
This applies an ease-out to the motion tween.

- 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).



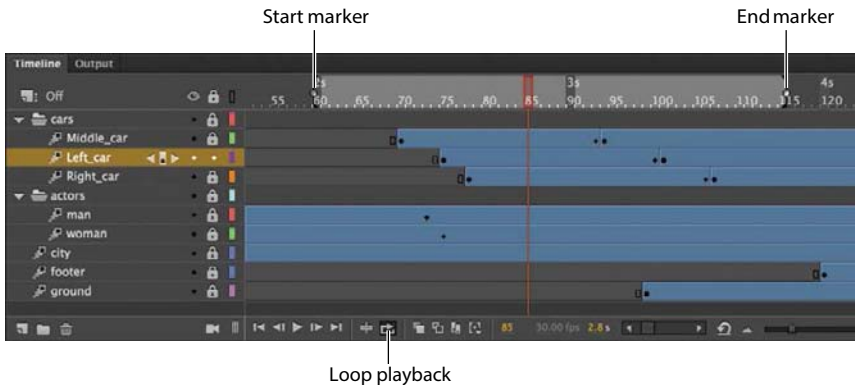
- 4 In the Properties panel, enter **100** for the Ease value to apply an ease-out to the motion tween.

- 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 panel, enter **100** for the Ease value to apply an ease-out to the motion tween.

- 7 Select Loop at the bottom of the Timeline and move the start and end markers in the Timeline header to frames 60 and 115, respectively.





## 8 Click Play (Enter/Return).

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

# Frame-by-Frame Animation

Frame-by-frame animation is a technique that creates the illusion of movement by making incremental changes between every keyframe. Frame-by-frame animation in Animate is similar to traditional hand-drawn cel animation, where each drawing is on a separate sheet of paper, and it's just as tedious.

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

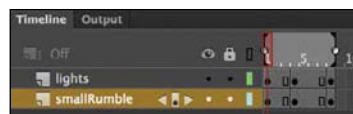
In the next section, you'll insert a frame-by-frame animation inside the carLeft movie clip symbol to make it move up and down in a jittery fashion. When the movie clip loops, the car will rumble slightly to simulate the idle of the motor.

## 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.

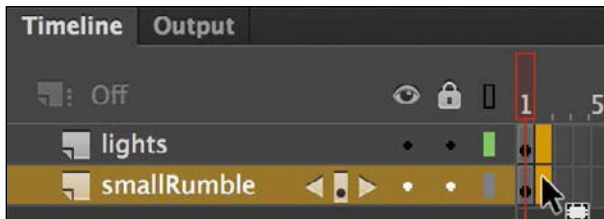


- 2 In the Library panel, double-click the carLeft movie clip symbol.

You enter symbol-editing mode for the carLeft symbol.

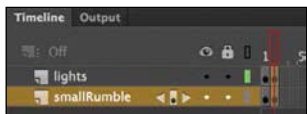


- 3 Select frame 2 in both the lights layer and the smallRumble layer.



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

Animate 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.



**Tip** If the image of the car isn't visible, select Fit In Window from the Zoom menu in the upper-right corner of the Stage.

## 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 (the car and its two headlights) on the Stage (Edit > Select All, or Ctrl+A/Command+A) and move them down the Stage by 1 pixel. Use the Properties panel to decrease the Y-position value by 1 pixel, or press the Down Arrow key to nudge the graphics by 1 pixel.

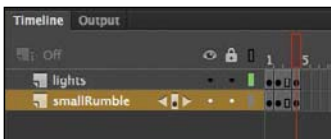
The car and its headlights move down slightly.

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

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

- 3 Right-click and choose Insert Keyframe (F6).

Keyframes are inserted into frame 4 of the lights and smallRumble layers. The contents of the previous keyframes are copied into the new keyframes.



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

The car and its headlights move up slightly.

● **Note** In this section, you created the car's idling motion by manually moving the car's position frame by frame. In the next lesson, you'll learn to use the Refine Tween panel, which can automatically modify your motion tween to simulate natural movements such as bounces or random jitters (as in the idling of a car).

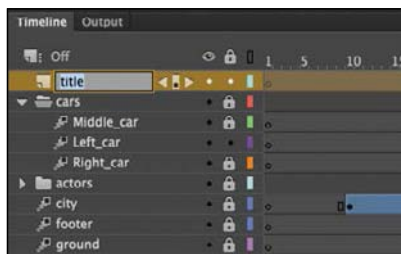
💡 **Tip** You can navigate quickly between multiple keyframes by choosing Control > Step Forward To Next Keyframe (Ctrl/Cmd+) or Control > Step Backward To Previous Keyframe (Ctrl/Cmd+). You can also click the forward-pointing or backward-pointing arrow in front of your layer name on the Timeline to move to the next or previous keyframe, respectively.

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

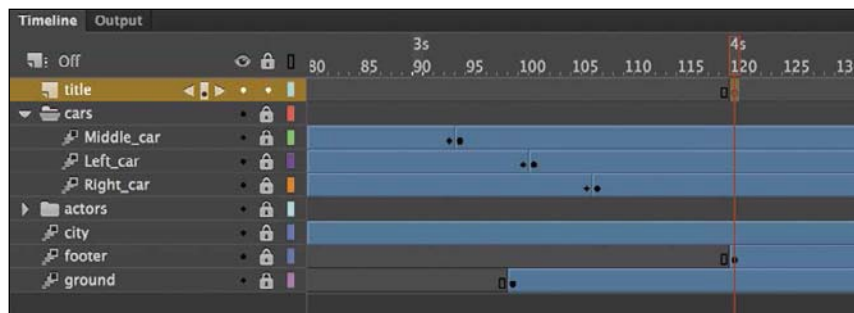
## Animating 3D Motion

Finally, you'll add a title and animate it in 3D space. Animating in 3D presents the added complication of a third axis (z). 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 tools and the Global Transform option were introduced in the Lesson 3 section "Positioning Objects in 3D Space.") Global Transform toggles between a global option (button selected) and a local option (button deselected). Moving an object with the global option selected makes the transformation relative to the global coordinate system, whereas moving an object with the local option on makes the transformation relative to itself.

- 1 Click Scene 1 in the Edit bar to return to the main Timeline. Insert a new layer at the top of the layer stack and rename it **title**.



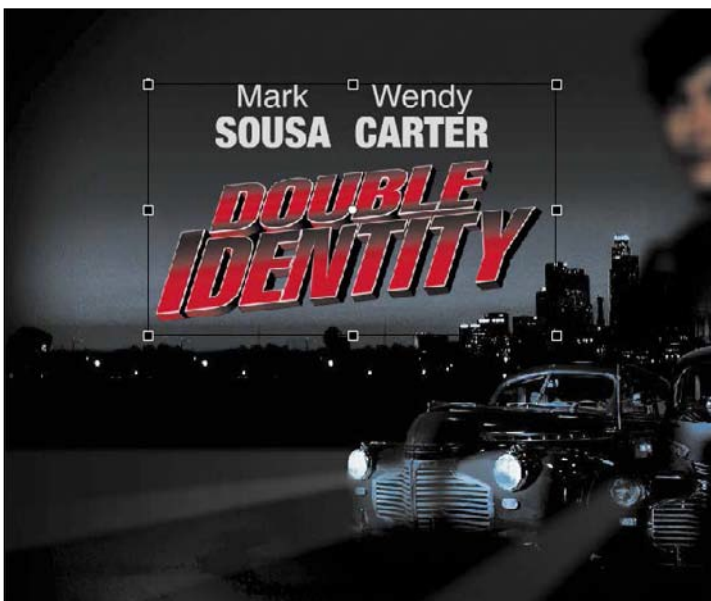
- 2 Lock all the other layers.
- 3 Insert a new keyframe at frame 120.



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

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

- 5 Position the title in the empty sky at x=180 and y=90.



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

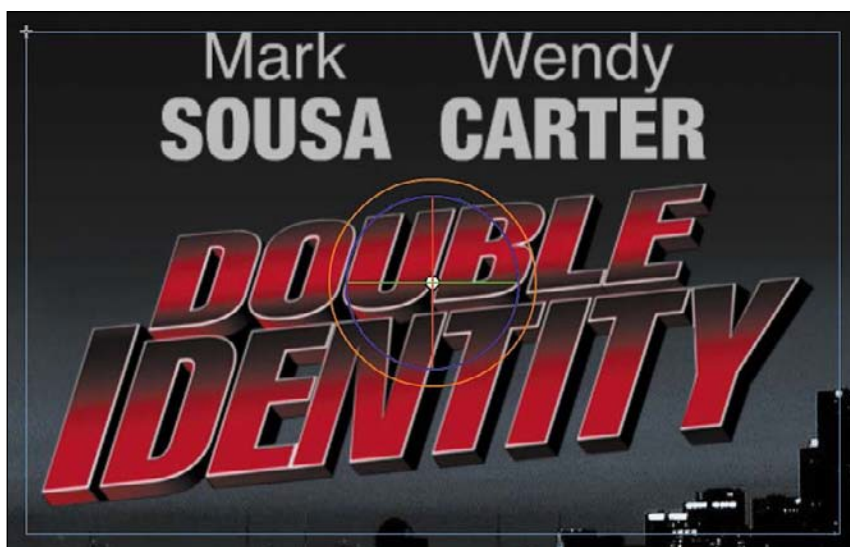
Animate converts the current layer to a tween layer so that you can begin to animate the instance.


- 7 Move the red playhead to frame 140.



- 8 Select the 3D Rotation tool .

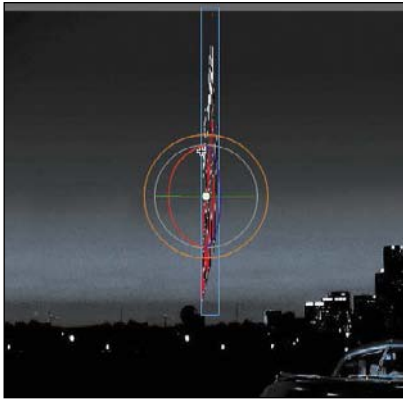
The 3D rotation control appears on the selected movie clip.



- 9 Deselect the Global Transform option  at the bottom of the Tools panel to put the 3D Rotation tool into local mode.
- 10 Drag upward on the left arm of the green Y control to rotate the title around the y axis to angle it so that it seems to recede into the distance. 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 Drag upward on the Y control to rotate the title around the y axis in the opposite direction so that the instance looks like just a sliver.



The change in the 3D rotation becomes a motion tween, so the title appears to swing in three dimensions.

## Exporting Your Final Movie

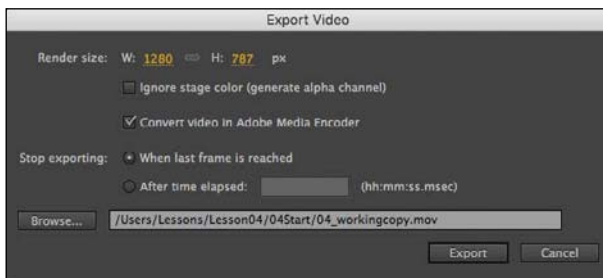
You can quickly preview your animation by “scrubbing” the red playhead back and forth on the Timeline, by choosing Control > Play, or by using the Time Scrub tool from the Tools panel. You can also use the integrated controller at the bottom of the Timeline. But to create your final project as a movie, you must export it.

Create an MP4 movie file by exporting the project and converting it in Media Encoder, a freestanding application that comes packaged with Animate (you’ll learn more about Media Encoder in Lesson 11).

- 1 Choose File > Export > Export Video.

The Export Video dialog box opens.

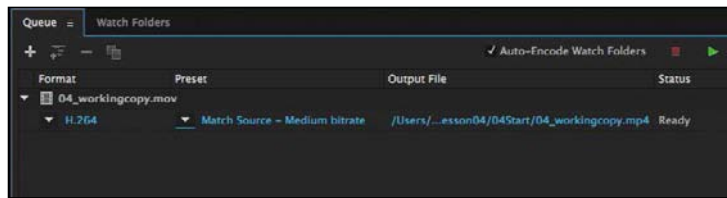
- 2 Keep the Render Size at its original dimensions. Select the Convert Video In Adobe Media Encoder option. Click Browse to select the destination filename and location. Click Export.



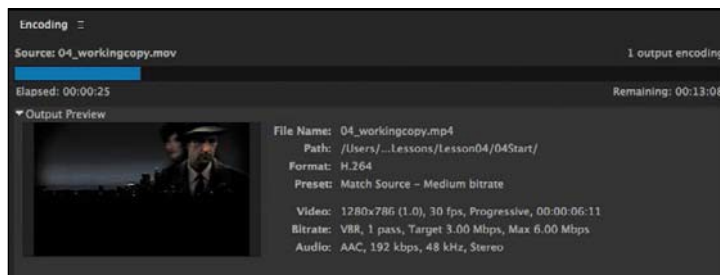
Animate generates a SWF file (.swf) and then saves a MOV (.mov) file from it. Adobe Media Encoder automatically launches.

● **Note** Animating the 3D rotation or translation of a symbol is not currently supported in HTML5 Canvas documents or in WebGL documents .

- 3 In Adobe Media Encoder, notice that your MOV file is already added to the Queue panel.



- 4 In the Queue panel's Preset menu, choose Match Source – Medium Bitrate. The Match Source – Medium Bitrate setting keeps the dimensions of the source file and balances file size and quality.
- 5 Click the Start Queue button (the green triangle) or press Enter/Return to begin the encoding process.
- 6 Media Encoder converts the MOV file into an H.264-formatted video with the standard .mp4 extension.



Congratulations—you're done! The final file can be uploaded to Facebook, YouTube, or other video sharing sites, or put up on a promotional website for the fictional cinematic release.

