Adobe Animate 2022 release

Classroom in a Book®

The official training workbook from Adobe

Russell Chun

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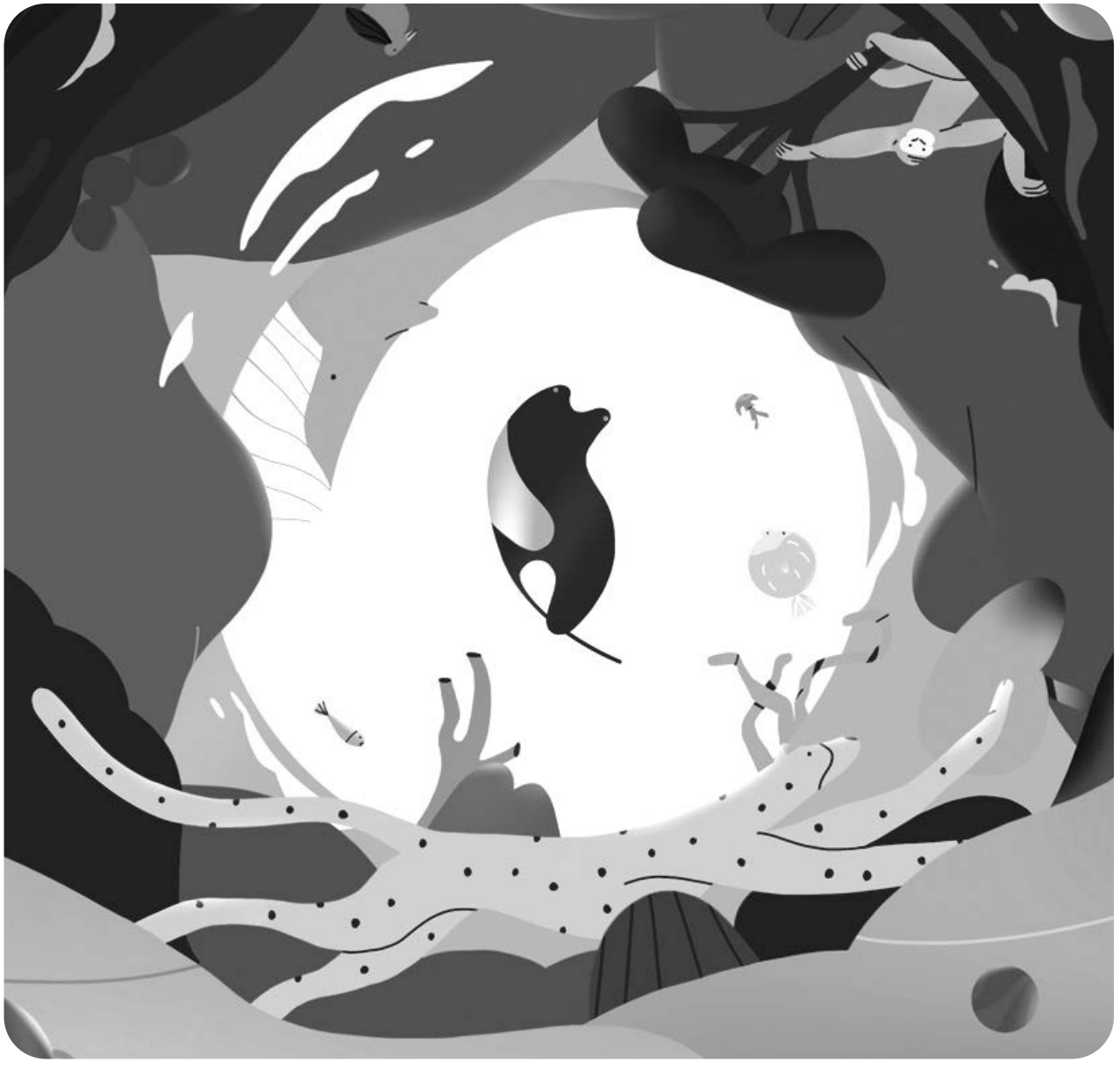

Classroom in a Book®

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Russell Chun

Adobe Animate Classroom in a Book® (2022 release)

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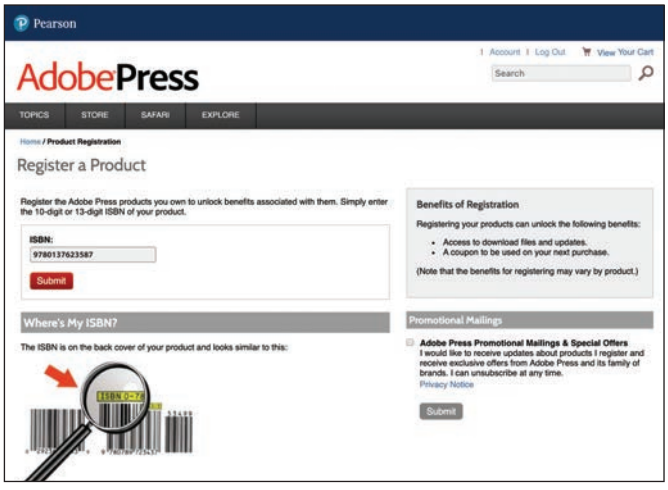

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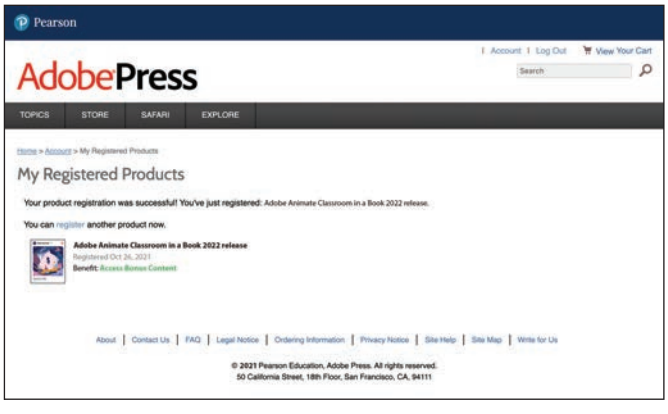

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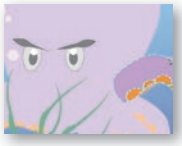

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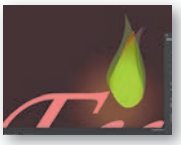

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BONUS LESSON **WORKING WITH SOUND AND VIDEO** ONLINE

3 ANIMATING SYMBOLS WITH MOTION TWEENS

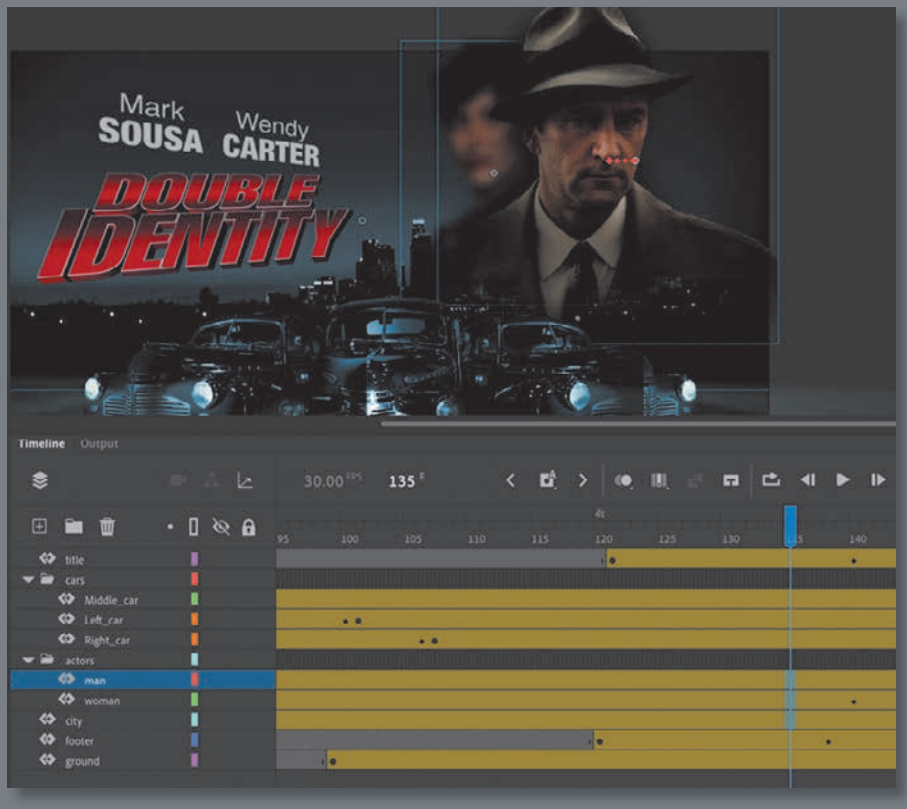
Lesson overview

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

- Animate the position, scale, and rotation of objects using motion tweening.
- Adjust the pacing and timing of your animation.
- Animate transparency and filters.
- Change the path of an object's motion.
- Create a nested animation.
- Split a motion tween.
- Change the easing of an object's motion.
- Animate in 3D space.

This lesson will take about 2 hours to complete.

To get the lesson files used in this chapter, download them from the web page for this book at www.adobepress.com/AnimateCIB2022. For more information, see "Accessing the lesson files and Web Edition" in the Getting Started section at the beginning of this book.



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

Getting started

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

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

1 Double-click the 03End.mp4 file in the Lesson03/03End folder to play the final animation, which was exported as a high-definition 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 03End.mp4 file.

3 Double-click the 03Start.fla file in the Lesson03/03Start 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 and then 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 **03_workingcopy.fla**, and save it in the 03Start 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 change of an object's appearance over time. Animation can be as simple as moving a ball across the Stage, which is a change in the object's position. It can also be much more complex. As you'll see in this lesson, you can animate many different properties of an object. In addition to an object's position, you can change its color or transparency, change its size or rotation, or even animate the 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 its property changes.

In Animate, the basic workflow for animation goes like this: Select an object on the Stage and choose Create Motion Tween. Move the 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.

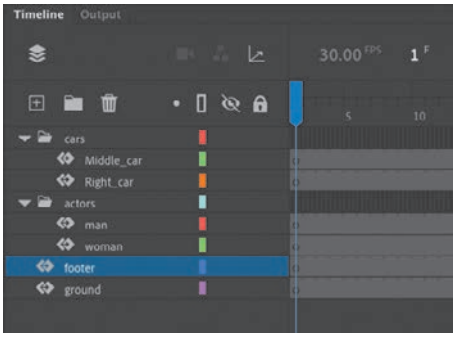
Motion tweens create animation for changes in position on the Stage and for changes in size, color, or other attributes. Motion tweens require you to use a symbol instance. If the object you've selected is not a symbol instance, Animate will automatically ask to convert the selection to a symbol.

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 very small on the left side of the Stage at the beginning keyframe and much larger at the far-right side of the Stage at an ending keyframe, and the resulting tween would make the spaceship both fly across the Stage and slowly grow in size.

Note 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 03Start.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.

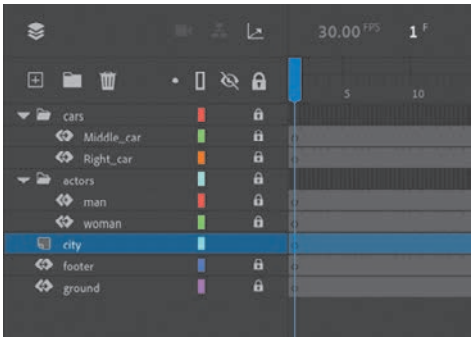


You'll be adding more layers to create an animated cityscape, refining the animation of one of the actors and adding a third car and a 3D title. All the necessary graphic elements have been imported into the library. The Stage is set at a standard HD size, 1280 pixels by 720 pixels, and the Stage color is black. You might need to choose a different view option to see the entire Stage.

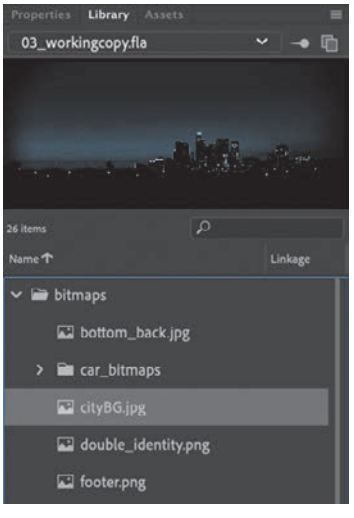
Animating position

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**.

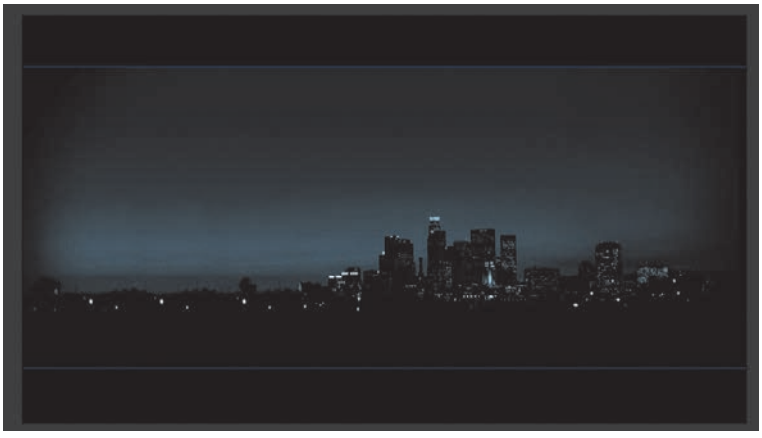


2 Drag the bitmap image called cityBG.jpg from the bitmaps folder in the Library panel to the Stage in frame 1 of the city layer.

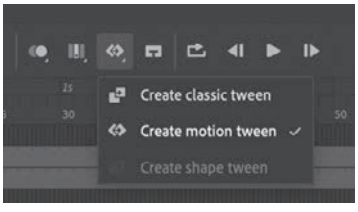


3 In the Properties panel, set the value of X to **0** and the value of Y to **90**.

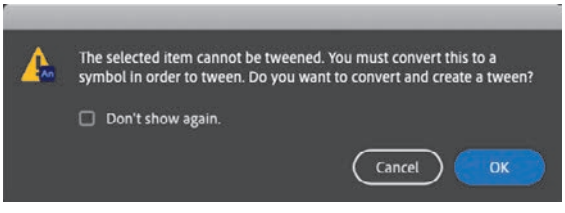
This positions the cityscape image just slightly below the top edge of the Stage.



4 Select the cityscape image and choose Create Motion Tween above the timeline, or right-click and choose Create Motion Tween, or choose Insert > Create Motion Tween.



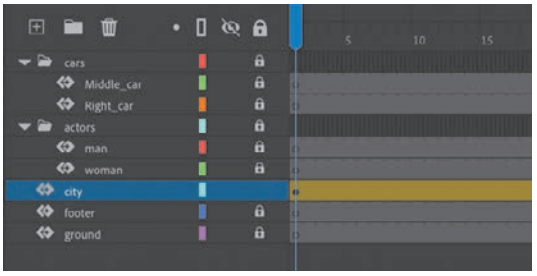
5 A dialog box appears warning you that your selected object is not a symbol. Motion tweens require symbols. Animate asks if you want to convert the selection to a symbol so that it can proceed with the motion tween. Click OK.



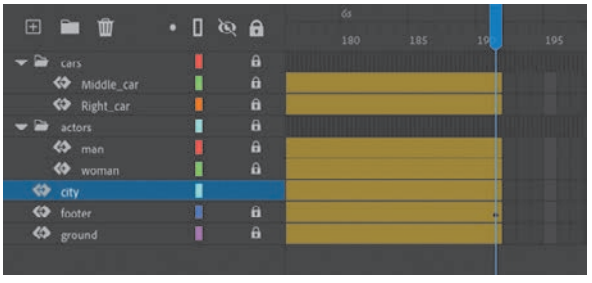
Animate automatically converts your selection to a symbol, with the default name Symbol 1, and stores it in your library. Animate also converts the current layer to a tween layer so that you can begin to animate the instance. Tween layers are distinguished by a special icon in front of the layer name, and the frames are tinted gold in the timeline. The range of frames covered by the tween is the tween span. The tween span is represented by all the colored frames from the

Tip Although in this task you had Animate automatically convert your object into a symbol for tweening, it's best practice to do it yourself before animating. That way, you control the naming and choice of the symbol yourself and have a better understanding of all your assets in your library.

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 blue 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 the vertical or horizontal direction.

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

8 For more precision, set the value of Y to **0.0** 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 playhead back and forth at the top of the timeline to see the smooth motion. You can also choose Control > Play (or press Return/Enter) to make Animate play the animation.

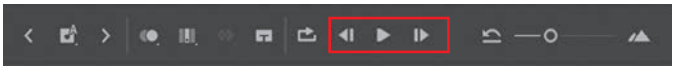
Animating changes in position is simple because Animate automatically creates keyframes at the points where you move your instance to new positions. If you want to have an object move to many different points, simply move the playhead to the desired frame and then move the object to its new position.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

▶ **Tip** Remove a motion tween by selecting the tween and clicking Remove Tween in the Frame tab of the Properties panel. You can also right-click the motion tween on the timeline or the Stage and choose Remove Motion Tween.

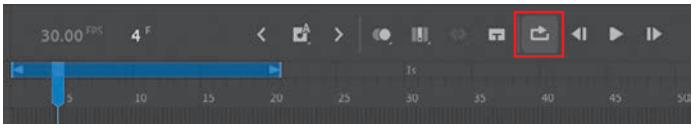
Previewing the animation

Integrated into the Timeline panel is a set of playback controls. These controls allow you to play, rewind, loop, 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 above the timeline to play, stop, or step forward or backward one frame. Hold the Step Forward or Step Backward button to move the playhead to the last or first frame.



2 Select the Loop button (to the left 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 the Loop button again to turn it off.

▶ **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. Select the Time Scrub tool (or hold down Spacebar+T) and drag left and right 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.

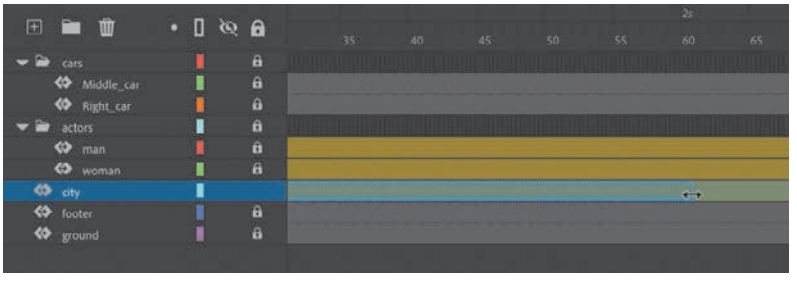
Changing the animation duration

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.

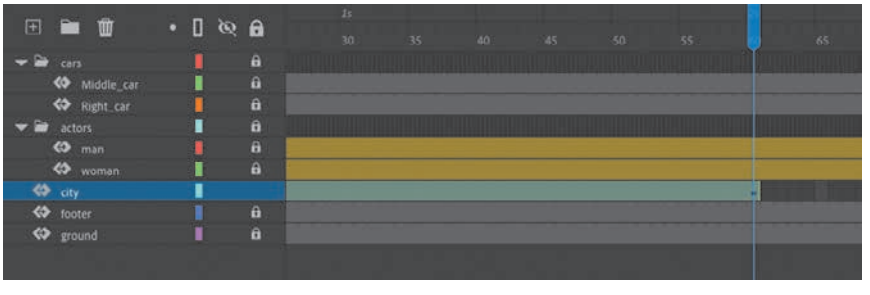
1 Move your mouse pointer close to the end of the tween span in the city layer.

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

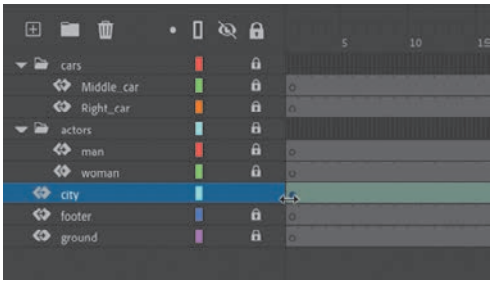
2 Drag the end of the tween span back to frame 60.



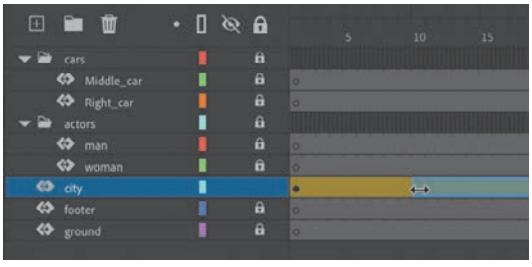
Your motion tween shortens to 60 frames, reducing the time it takes the cityscape to move.



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



4 Drag the beginning of the tween span forward to frame 10.



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

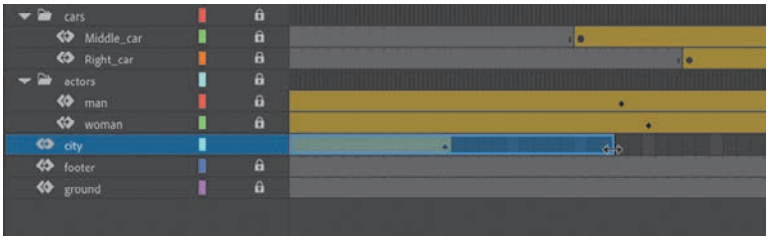
Note If you have multiple keyframes in a tween, changing the length of the tween span by dragging one end or the other will distribute all your keyframes uniformly. The relative timing of events in your animation remains the same; only the length changes.

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.

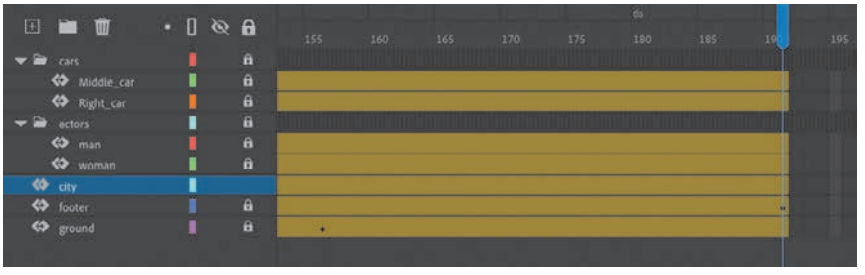
1 Move your pointer close to the end of the tween span.

2 Hold down the Shift key and drag the end of the tween span forward to frame 191. Make sure that your tween span is *not* selected.



▶ **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).

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

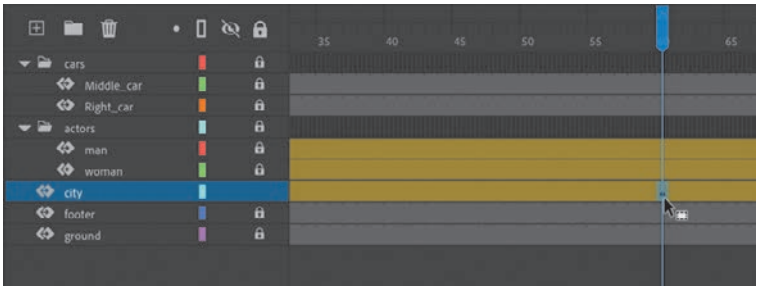


Moving keyframes

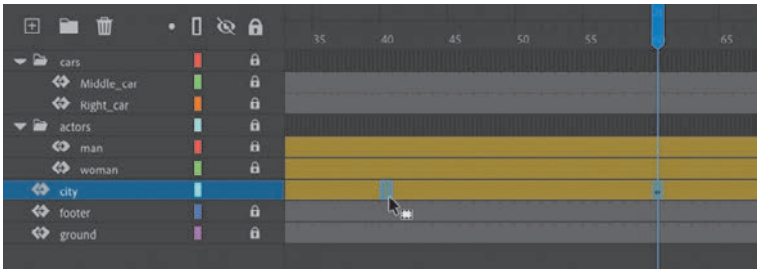
If you want to change the pacing of an animation, you can select individual keyframes and then drag them to new positions.

1 Click the keyframe at frame 60.

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



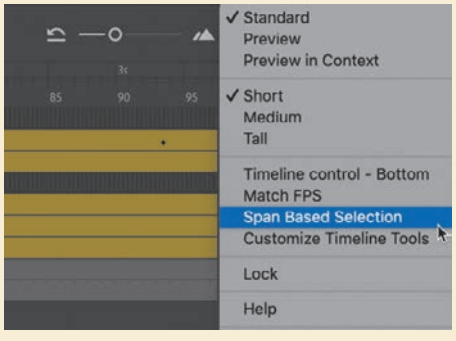
2 Drag the keyframe to frame 40.



Now, because the last keyframe in the motion tween is reached earlier in the animation, 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 frames 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 Frame View menu in the upper-right corner of the Timeline panel (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 Command/Ctrl and click a keyframe.

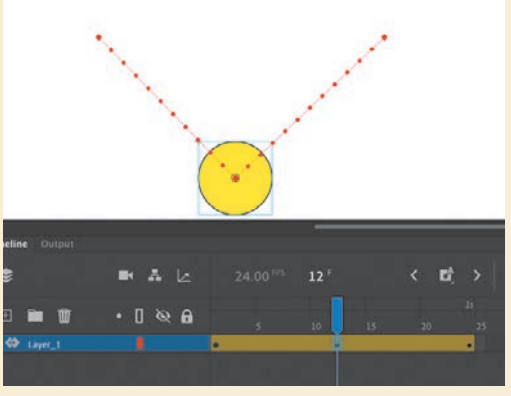
Moving keyframes vs. changing time in tween spans

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.

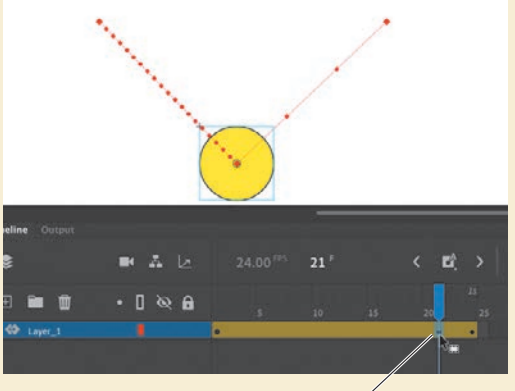
If you want to simply move the location of a keyframe within a tween span, make sure that only a single keyframe is selected and that the tiny box appears next to your pointer as you begin dragging the keyframe to a new location.

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

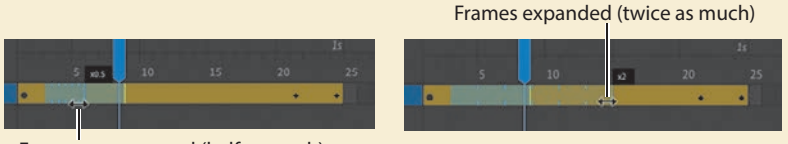
Consider the following animation, where a ball moves from the left side of the Stage to the bottom edge and then to the right side, making a figure "V." On the timeline, three keyframes mark the three positions of the ball.



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. A black flag appears indicating when the amount of compression or expansion is a multiple of the original length (x0.5, x2, x4, etc.).



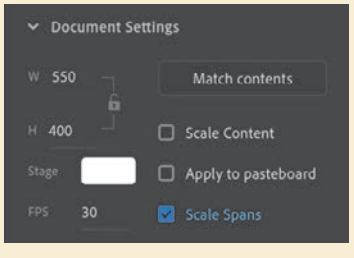
Understanding frame rate

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

The frame rate determines how many frames on the timeline make up 1 second of time. The default is either 30 or 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 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 frames to, or delete frames from, your timeline.

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

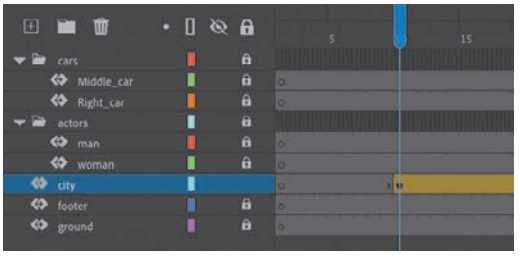


Animating transparency

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.

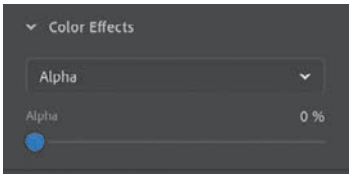
1 Move the playhead to the first keyframe of the motion tween (frame 10).



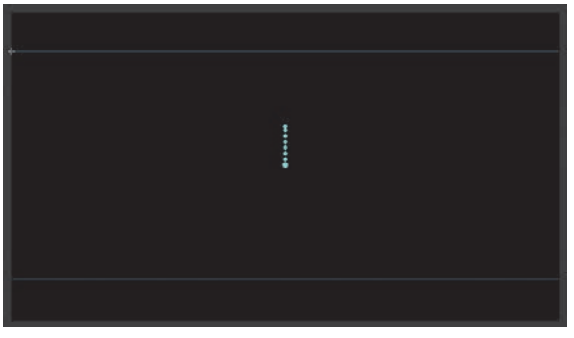
2 Select the cityscape instance on the Stage.

3 In the Color Effects section of the Properties panel, choose Alpha from the Style menu.

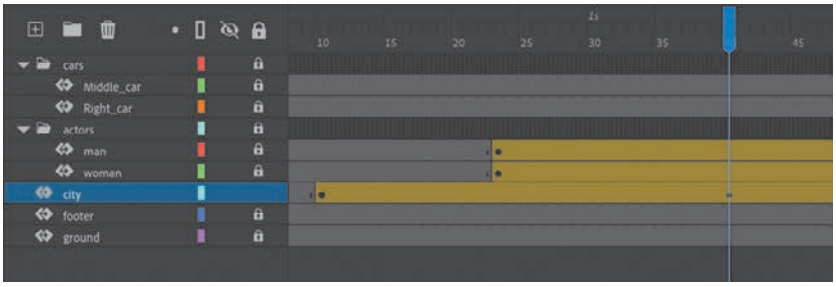
4 Set the Alpha value to **0**%.



The cityscape instance on the Stage becomes totally transparent, but you can still see the blue bounding box around it.



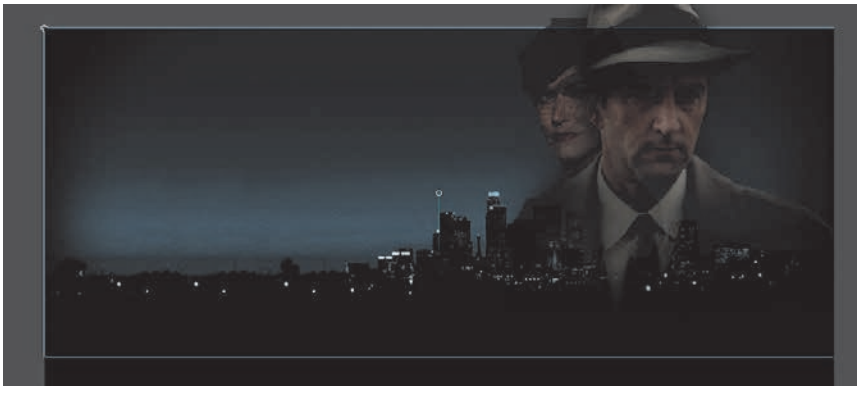
5 Move the playhead to the last keyframe of the motion tween (frame 40).



6 Make sure that the cityscape instance on the Stage is still selected.

7 In the Properties panel, in the Color Effects 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 Return/Enter).

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

Animating filters

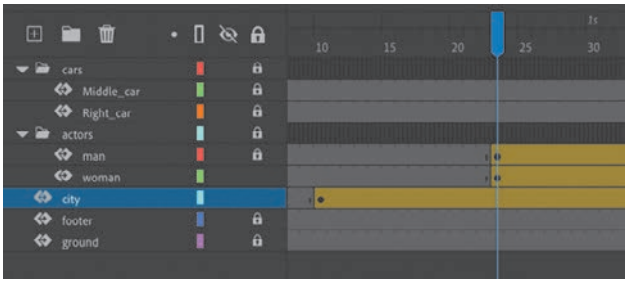
Filters, which give instances special effects such as blurs and drop shadows, can also be animated. You'll next refine the motion tween of the actors by applying a blur filter to one of them to make it appear as if the camera changes focus. Animating filters is no different from animating changes in 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 be applied, but not animated, in an HTML5 Canvas document.

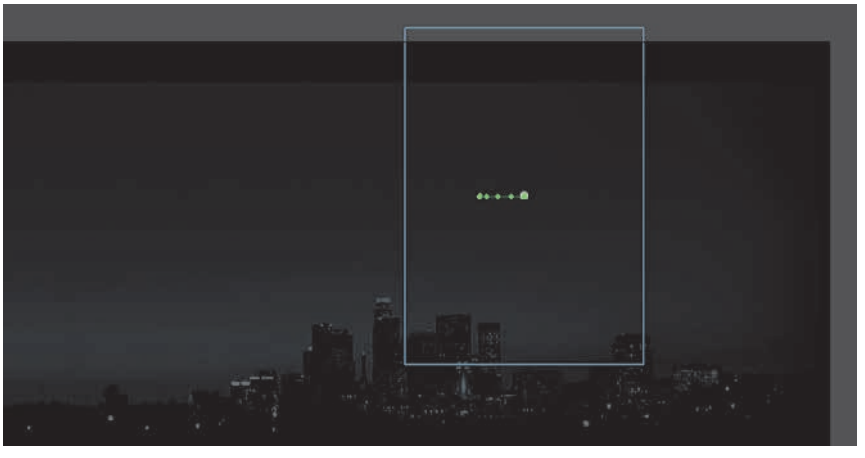
1 Make sure that the actors layer folder on the timeline is visible.

2 Unlock the woman layer.

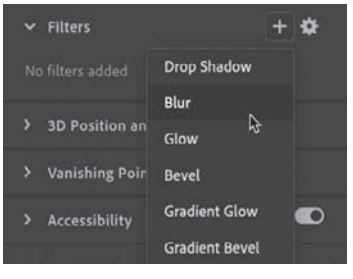
3 Move the playhead to the beginning keyframe of the motion tween in the woman layer, at frame 23.



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 frame 23 in the woman layer in the timeline to highlight it, then click the Object tab in the Properties panel.



5 In the Properties panel, click the Add Filter (+) button in the Filters section, and choose Blur from the menu to add a blur to the instance.

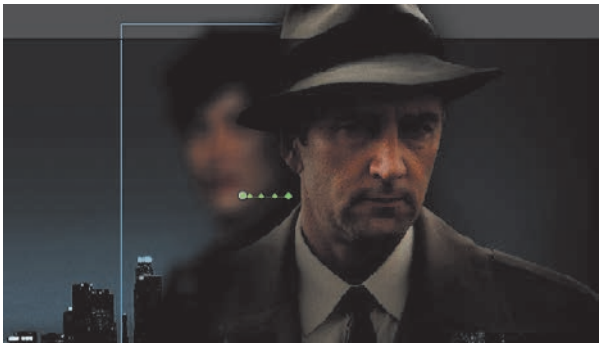


6 In the Filters section of the Properties panel, select the link icon to apply equal values to the *x* and *y* directions if it isn't already selected. Set the Blur X value to **20** pixels.

The Blur Y value also changes to 20 pixels.

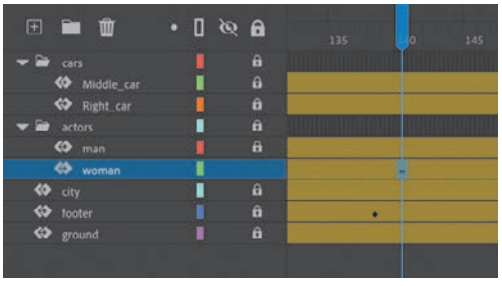
7 Move the playhead along the entire timeline to preview the animation.

The woman instance is blurred throughout the motion tween.

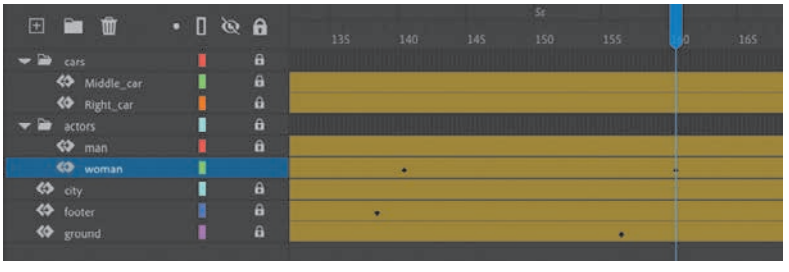


8 Select frame 140 in the woman layer and choose Insert Keyframe above the timeline.

Animate establishes a keyframe at frame 140.



9 Select frame 160 of the woman layer and choose Insert Keyframe above the timeline to add another keyframe.

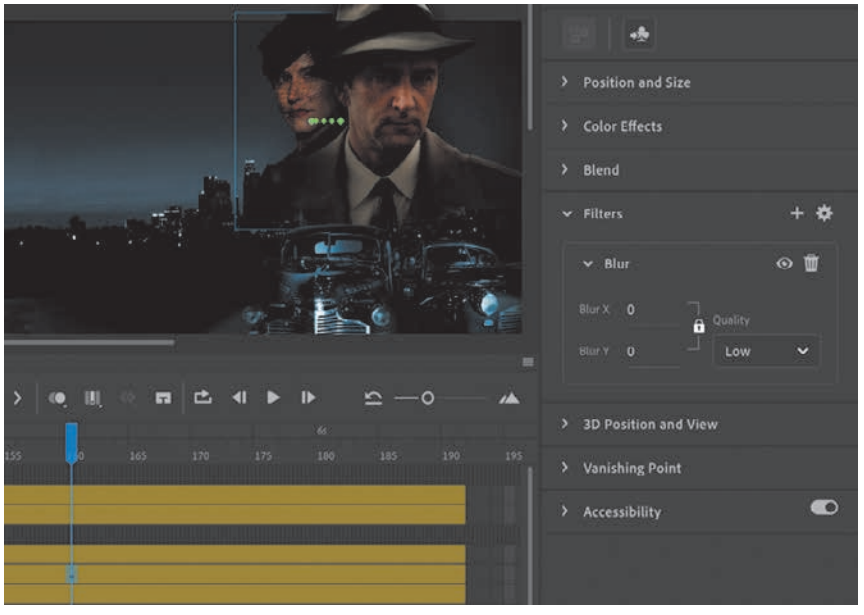


Tip Click the Enable or Disable Filter button in the Filters section of the Properties panel to toggle the visibility of the filter effect on your animation to make your work easier. The Enable or Disable Filter option doesn't affect the final exported animation, however.

Tip You can add more than one filter to an animation. Drag the filters to rearrange the order in which they appear in the Properties panel, or collapse each filter to save space in the panel.

10 Select the Object tab of the Properties panel.

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

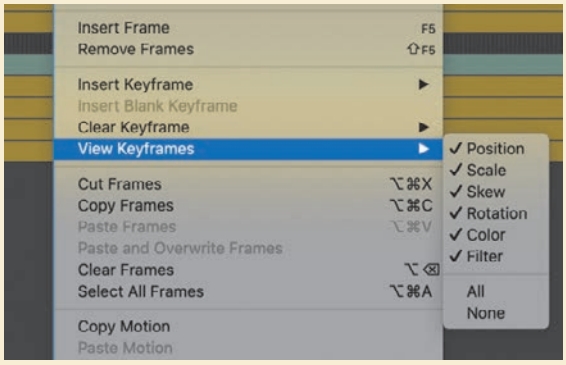


The Blur filter changes from the keyframe at frame 140 to the keyframe at 160. Animate creates a smooth transition from a blurry instance to an in-focus instance.

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 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 choose 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 Keyframe, and then select the desired property.

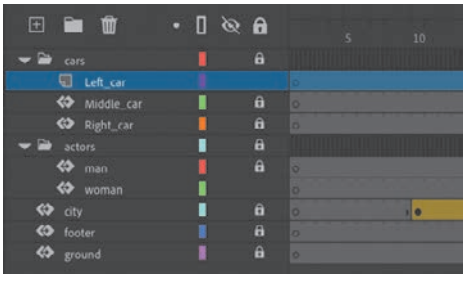
You can also view an advanced panel, called the Motion Editor, to see and edit how the different properties of your object change over the course of the motion tween. You'll learn more about the Motion Editor in the next lesson.

Animating transformations

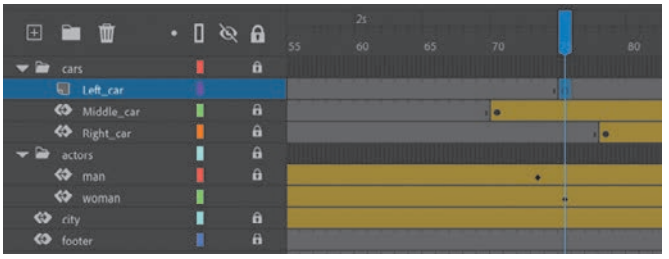
Now you'll learn how to animate changes in scale or rotation. These kinds of changes are made with the Free Transform tool or with the Transform panel. You'll add a third car to the project. The car will start small and then become larger as it appears to move forward toward the viewer.

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 or Insert Keyframe button).



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**%.

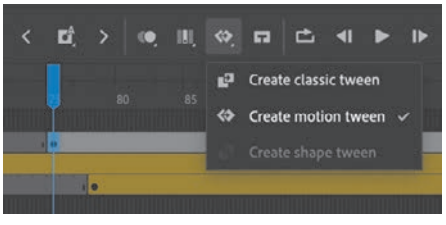
8 Move the car to its starting position at about X=**710** and Y=**488**.

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

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

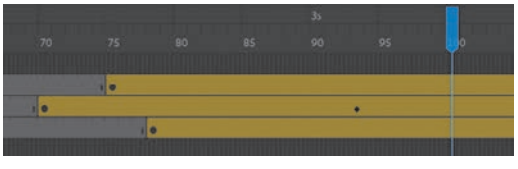
The car becomes totally transparent.

11 Choose Create Motion Tween from the button above the timeline.



The current layer becomes a tween layer.

12 Move the playhead to frame 100.

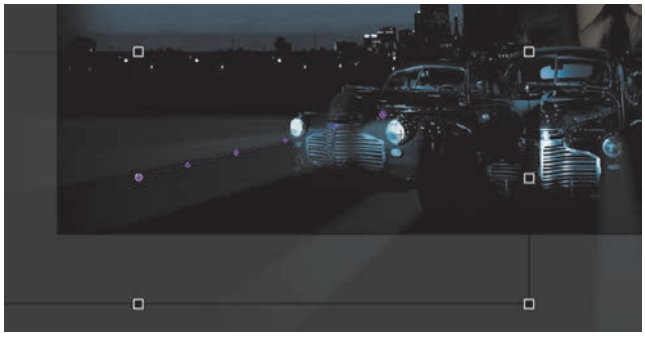


13 Make sure the transparent instance of the car on the Stage is selected, and in the Properties panel, change the Alpha value to **100**%.

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

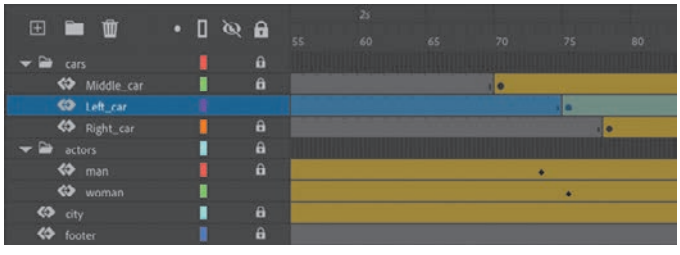
14 While holding down the Shift key, drag a corner handle outward to make the car larger. For more precision, use the Properties panel and set the dimensions of the car to width=**1380** pixels and height=**445.05** pixels.

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.



Save your progress so far in this document, 03_workingcopy.fla.

Tip Holding down the Option/Alt 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).

Editing multiple frames

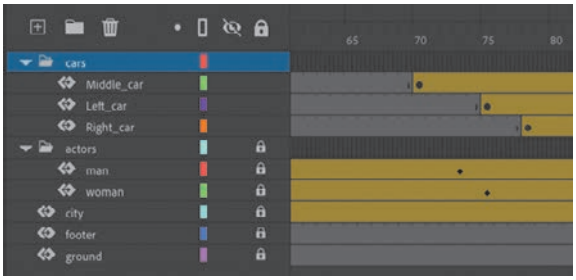
If you need to make the same change across multiple keyframes, you can use the Edit Multiple Frames option above the timeline. The option allows you to make edits that affect many keyframes in the same layer or even across many different layers.

For example, imagine that you liked the animation of the cars in this project, but you wanted to move the animation to a different location on the Stage. Instead of moving every instance at each keyframe of the animation, the Edit Multiple Frames option lets you do one move for all of them at once.

Moving the animation of the cars

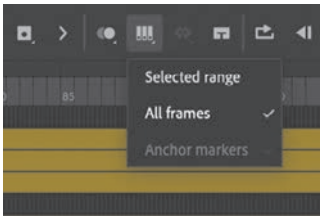
You will move the animation of the cars so that they are centered on the Stage.

1 Lock all the layers except the layers in the cars folder.



2 Select and hold the Edit Multiple Frames option above the timeline and choose All Frames.

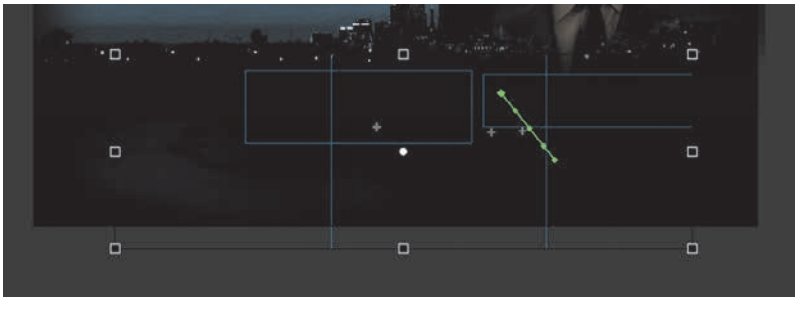
Brackets appear on the timeline indicating the span of frames that will be editable. The All Frames option automatically puts the brackets at the beginning and end to encompass all the frames of the timeline.



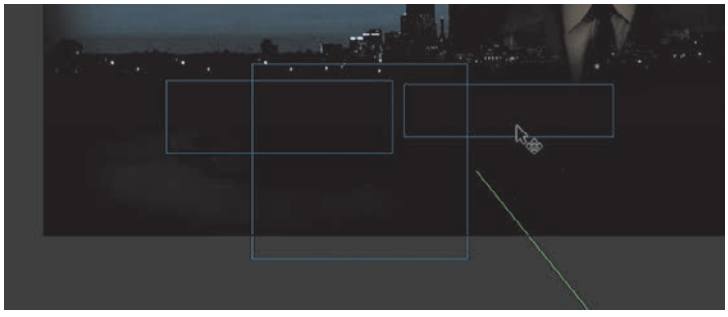
Choose Selected Range if you want to select only a span of frames. With the Selected Range option, you can move the beginning or end bracket.

3 Choose Edit > Select All (Command+A/Ctrl+A).

All the frames in the layers of the cars folder become selected.



4 While holding down the Shift key, drag the selected group of cars to the left of the Stage. Move the group so that they are generally centered on the Stage.



You are actually moving multiple instances in multiple keyframes across all three layers at the same time.

5 Deselect Edit Multiple Frames.

6 Scrub the timeline from frames 70 to 191.

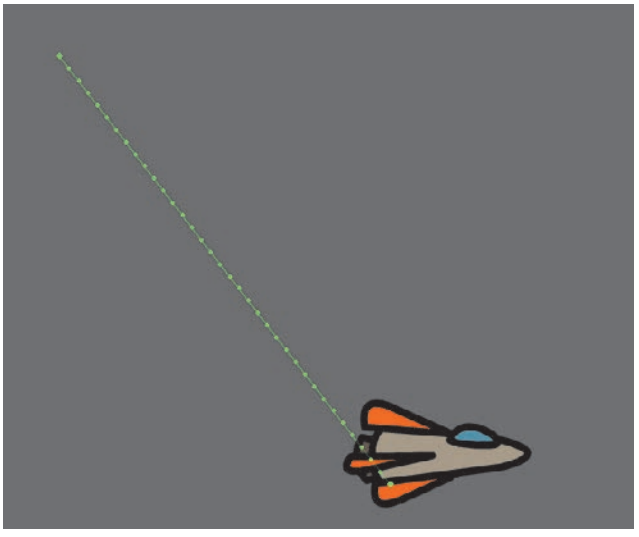
The three cars remain animated with changes in size, color effect, and position, but they have been moved to the center of the Stage.

Save your work. 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 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 03MotionPath.fla in the Lesson03/03Start folder. The file contains a single tween layer with a rocket ship moving from the top left of the Stage toward the bottom right.

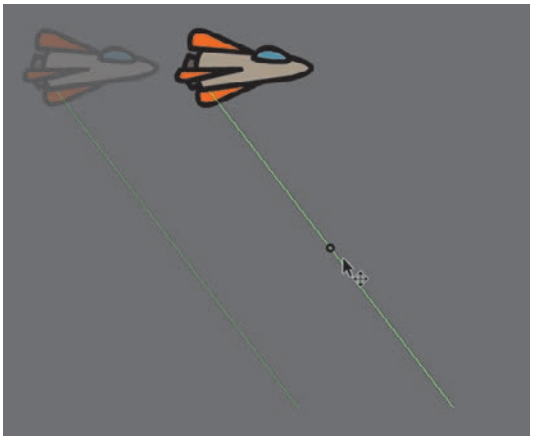


Moving the path of the motion

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.

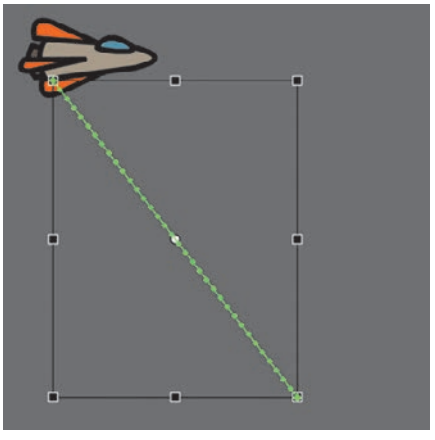
Changing the scale or rotation of the path

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

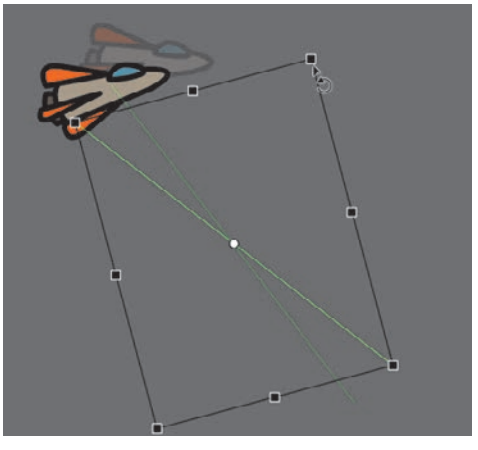
1 Select the path of the motion.

2 Select the Free Transform tool.

Transformation handles appear around the path of the motion.



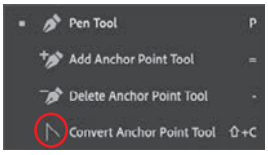
3 Scale or rotate the path of the motion as desired. You can make the path smaller or larger or rotate the path so that the rocket ship starts from the bottom left of the Stage and ends at the top right.



Editing the path of the motion

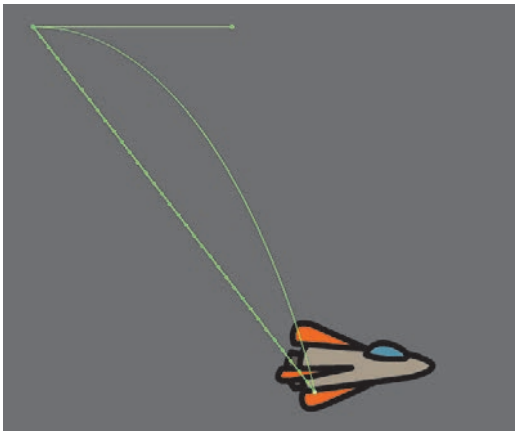
Making your objects travel on a curved path is a simple matter. You can edit the path with Bezier precision using anchor point handles, or you can edit the path in a more intuitive manner with the Selection tool.

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



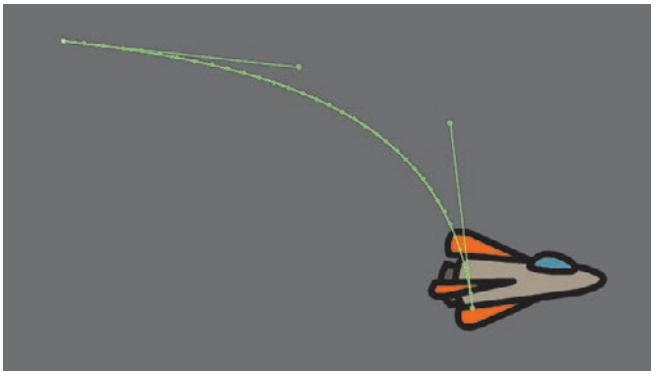
2 Drag from the starting point and the ending point of the motion path on the Stage to pull control handles out from each anchor point.

The handles on the anchor points control the curvature of the path.



3 Select the Subselection tool.

4 Drag the handles at either end of the path to edit its curve. Make the rocket ship travel in a wide curve.



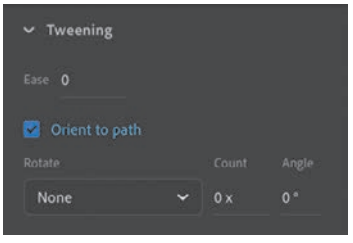
Tip You can also directly manipulate the path of the motion with the Selection tool. Select the Selection tool and make sure the path is deselected. Move your pointer close to the path of the motion. A curved icon appears next to your pointer, indicating that you can edit the path. Drag the path of the 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.

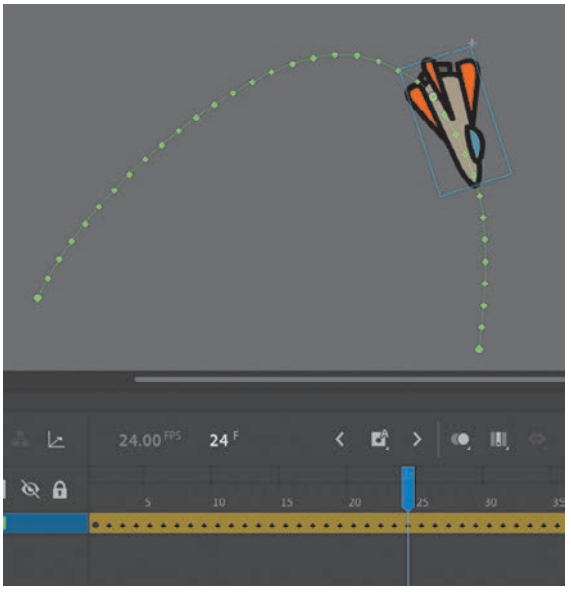
1 Select the motion tween on the timeline (Shift-click to select the whole tween).

2 In the Properties panel, under the Tweening section, select the Orient To Path option.



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.

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

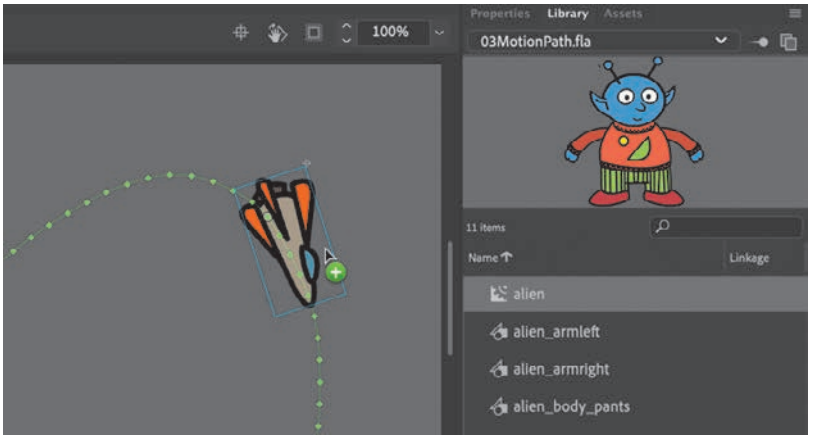


Swapping tween targets

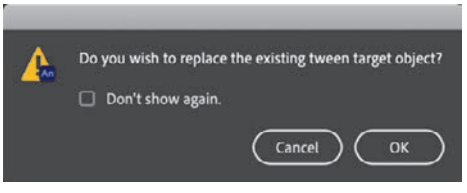
The motion tween model in Animate is object based. This means that an object and its motion are independent of each other, and you can easily swap out the target of a motion tween. If, for example, you'd rather see an alien than a rocket ship moving around the Stage, you can replace the target of the motion tween with an alien symbol from your Library panel and still preserve the animation. This is especially useful when you want to work out the motion of a character before the design is final. You can create the animation with placeholder graphics and easily swap them in the end with the final versions.

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.

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



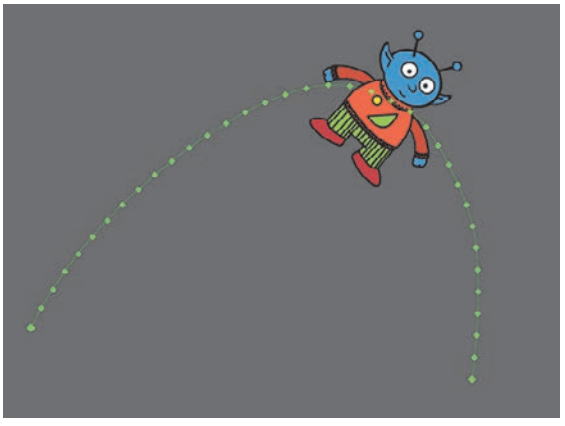
Animate asks if you want to replace the existing tween target object with a new object.



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.

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



Creating nested animations

Often, an object that is animated on the Stage will have its own internal animation. For example, the wings of a butterfly moving across the Stage may flap as the butterfly 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.

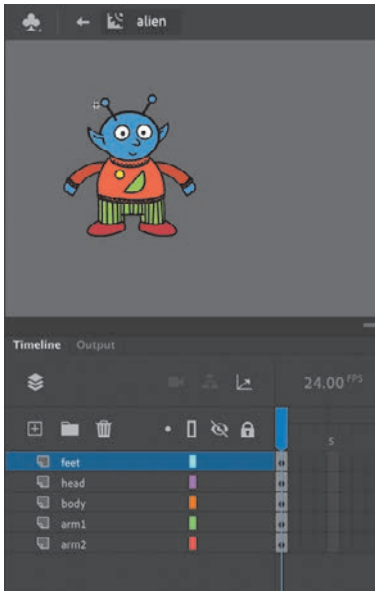
In this example, you'll give the alien his own independent movement so he can wave as he flies across the Stage.

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.

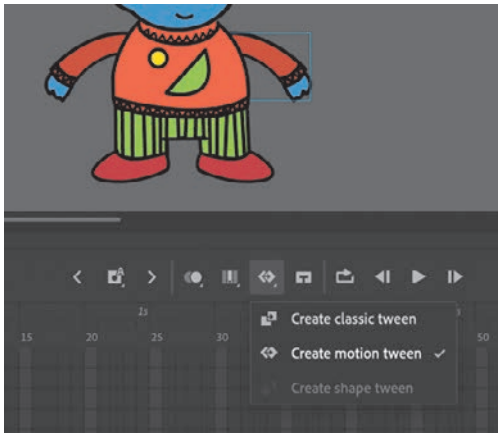
1 In the Library panel, double-click the alien movie clip symbol icon.

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.

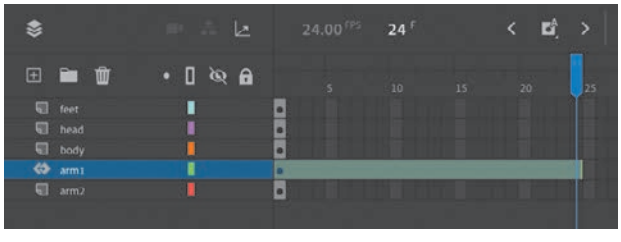


2 Select the Selection tool.

3 Select 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 pointer 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.

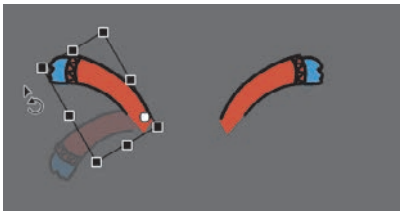
6 Move the playhead back to frame 1.

7 Create a motion tween for the alien's other arm. Select his right arm and choose Create Motion Tween.

Animate converts the current layer into a tween layer and inserts 1 second's worth of frames.

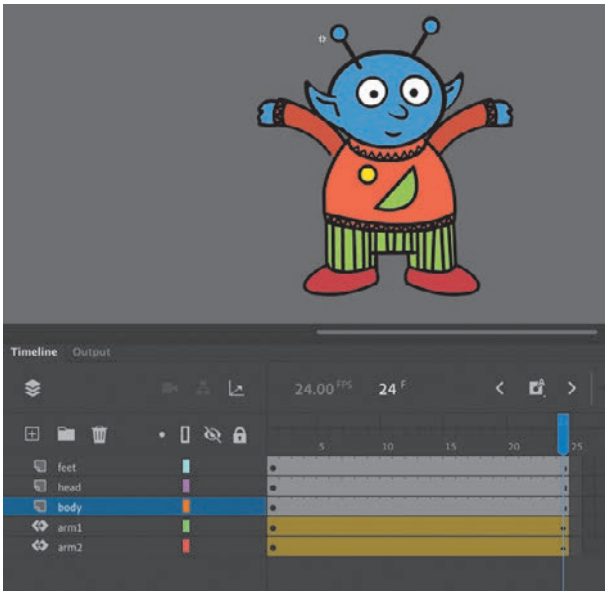
8 Select the Free Transform tool if it's not selected already.

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.

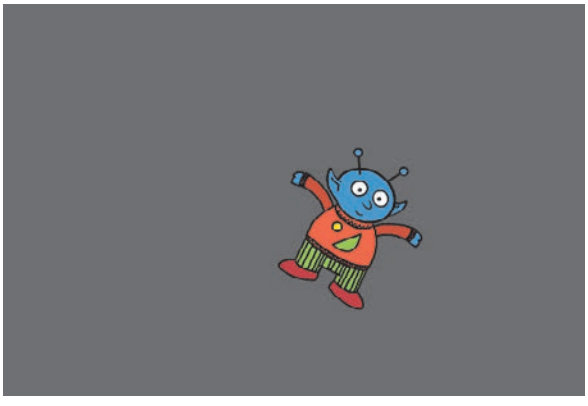


Note Animations inside movie clip symbols won't play on the main timeline. Choose Control > Test to preview nested animations, or use the Test Movie button at the upper-right corner of the interface.

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, or use the Test Movie button in the upper-right corner of the Animate interface.



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 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.

Tip Quickly build nested animations with a workflow shortcut, Convert Layers To Symbols. If you have an animation on the main timeline, simply select the layers, right-click, and choose Convert Layers To Symbol. Animate will put the selected layers into a symbol of your choosing and leave an instance of the symbol on the Stage.

Easing

Easing refers to the way in which a motion tween proceeds. You can think of easing for changes in position as acceleration or deceleration. An object that moves from one side of the Stage to the other side can start off slowly, 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.

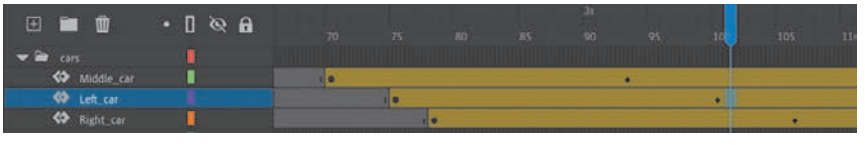
A simple way to apply easing to a motion tween is to use the Properties panel. Easing values range from –100 to 100. A negative value creates a more gradual change from the starting position (known as an ease-in). A positive value creates a gradual slowdown (known as an ease-out).

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

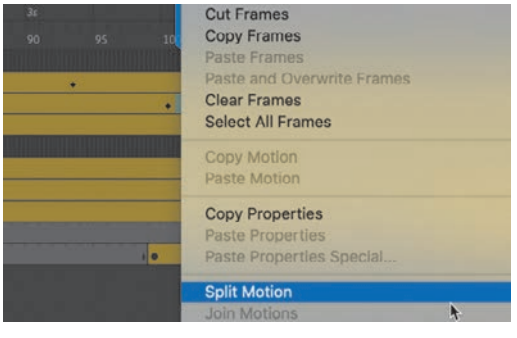
Splitting a motion tween

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 03_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.

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.

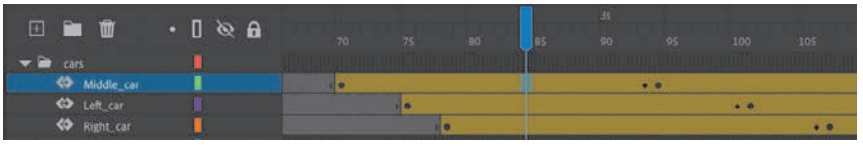
4 In the Right_car layer, select frame 107, right-click, and choose Split Motion to cut the motion tween into two spans.

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

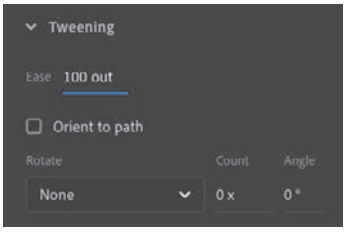
Applying eases to motion tweens

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).

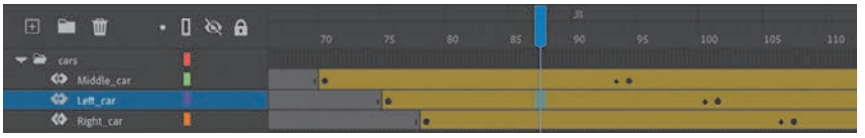


2 In the Tweening section of the Properties panel, enter **100** for the Ease value.



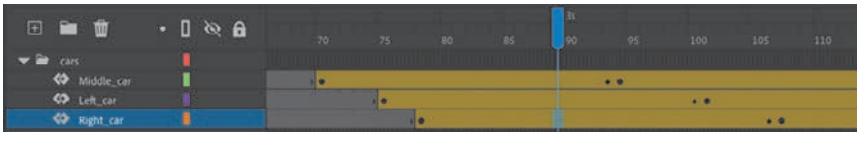
This applies an ease-out to the motion tween.

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 top of the Timeline panel and move the start and end markers in the timeline header to frames 60 and 115, respectively.

8 Click Play (Return/Enter).

Animate plays the timeline in a loop between frames 60 and 115 so that you can examine the ease-out motion of the three cars. The three cars slow down as they approach their final keyframes, giving them a sense of weight and realism.

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. It's also just as tedious, but the results can be very creative.

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

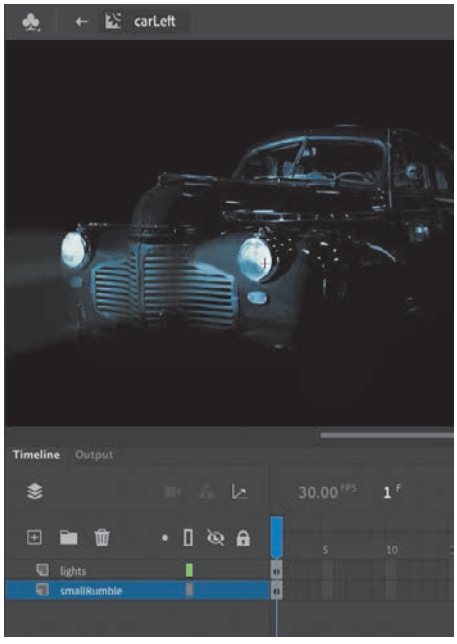
The frame-by-frame animations inside the carMiddle and carRight movie clip symbols have already been done. You'll finish the animation for the carLeft symbol.

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.

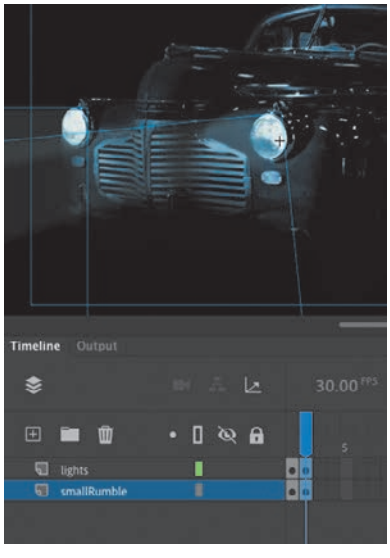


3 Select frame 2 in both the lights layer and the smallRumble layer.

4 Choose Insert Keyframe (or 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 Command+A/Ctrl+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. 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.

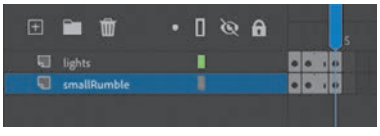
3. Choose Insert Keyframe (or F6).

   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 Command+A/Ctrl+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.

5. You now have three keyframes for both layers inside the movie clip.



   Test the idling motion by enabling the Loop option at the top of the Timeline panel and clicking Play (Return/Enter). Choose Control > Test to preview the entire animation.

Tip You can navigate quickly between multiple keyframes by choosing Control > Step Forward To Next Keyframe (Alt/Option+.) or Control > Step Backward To Previous Keyframe (Alt/Option+,). You can also click the forward-pointing or backward-pointing arrow to the left of the playback controls at the top of the Timeline panel to move to the next or previous keyframe, respectively.

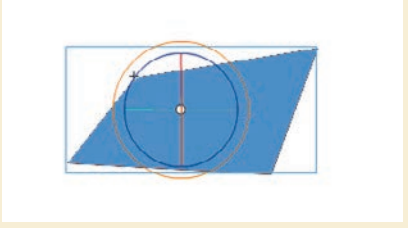
Note In this section, you created the car's idling motion by manually moving the car's position frame by frame. In the next lesson, you'll learn to use the Refine Motion Tween panel, which can automatically modify your motion tween to simulate natural movements such as bounces or random jitters (as in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

Animating 3D motion

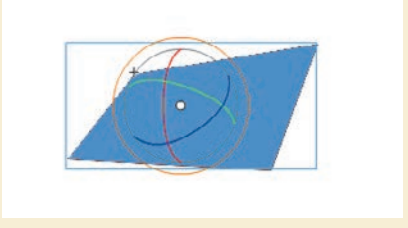
Finally, you'll add a title and animate it in 3D space. Animating in 3D presents the added complication of a third axis (z). When you choose the 3D Rotation or 3D Translation tool, you need to be aware of the Global Transform option at the bottom of the Tools panel (see the sidebar "Global vs. local transformations"). Global Transform toggles between a Global option (when you select the button) and a Local option (when you deselect the button). Moving an object in Global mode makes the transformation relative to the global coordinate system, whereas moving an object in Local mode makes the transformation relative to itself.

Global vs. local transformations

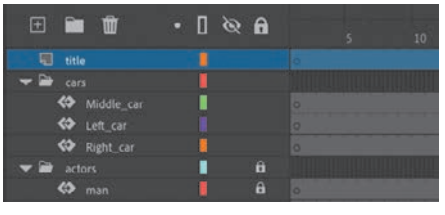
When you select the 3D Rotation or 3D Translation tool, be aware of the Global Transform toggle button found at the bottom of the Tools panel when one of the 3D tools is selected. When the button is toggled on (and highlighted), Global mode is engaged and the rotation and positioning of 3D objects are relative to the global, or Stage, coordinate system. The 3D display over the object that you're moving shows the three axes in constant position, no matter how the object is rotated or moved. Notice in the following image how the 3D display is perpendicular to the Stage.



However, when the Global Transform option is turned off (the button is not highlighted), Local mode is in force and rotation and positioning are relative to the object. The 3D display shows the three axes oriented relative to the object, not to the Stage. For example, in the following image, notice that the 3D Rotation tool shows the rotation relative to the object, not to the Stage.

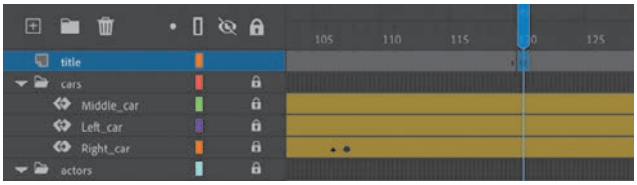


1 Click Scene 1 in the Edit bar to return to the main timeline. Insert a new layer at the top of the layer stack and rename it **title**.



2 Lock all the other layers.

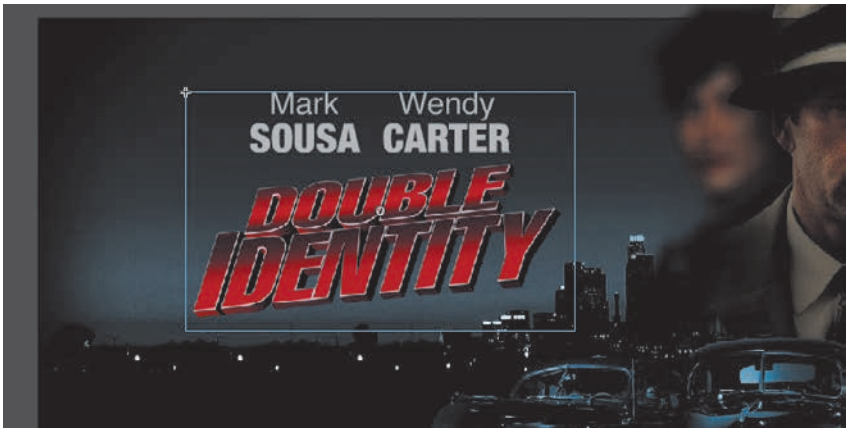
3 Insert a new keyframe at frame 120.



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**.



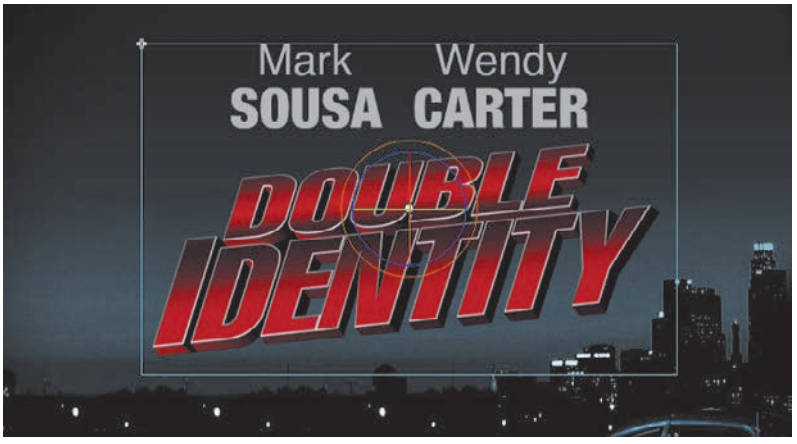
6 With the movie title selected, choose Create Motion Tween.

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

7 Move the playhead to frame 140.

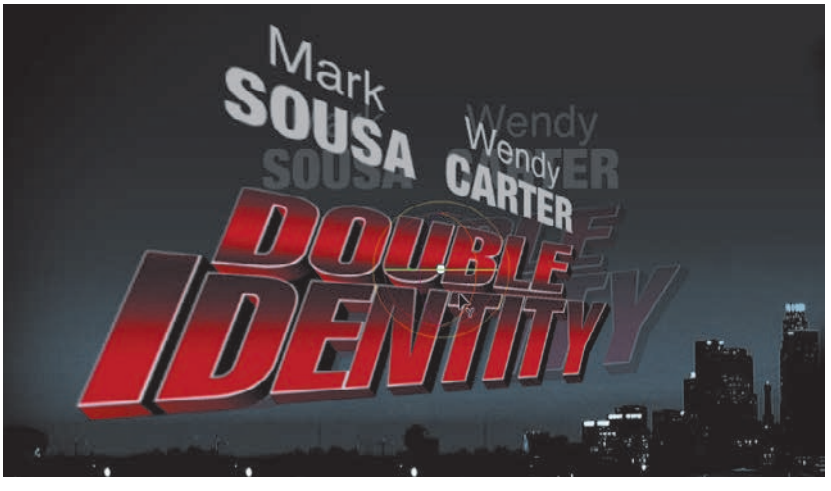
8 Select the 3D Rotation tool. The 3D Rotation tool is hidden in the additional tear-off tools at the bottom of the Toolbar (you'll have to add it to your Toolbar to use it).

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



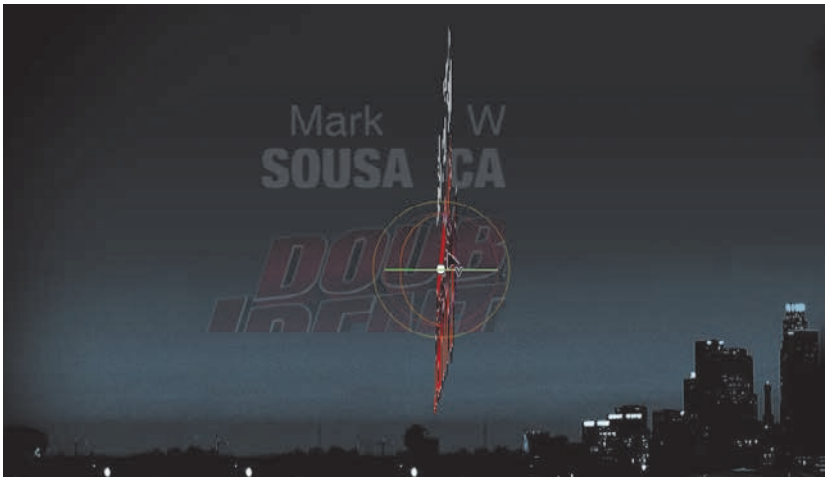
9 Deselect the Global Transform button at the bottom of the Tools panel to put the 3D Rotation tool into Local mode.

10 Drag 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 playhead to the first keyframe, at frame 120.

12 Drag upward on the right arm of 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.

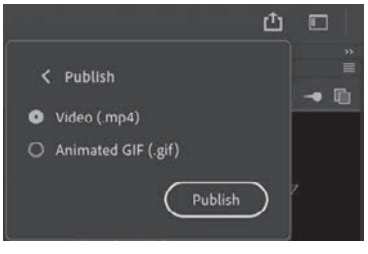
Note Animating the 3D rotation or translation of a symbol is not currently supported in HTML5 Canvas documents.

Exporting your final movie

You can quickly preview your animation by "scrubbing" the 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 top of the Timeline panel. But to create your final project as a movie, you must export it.

Use the Quick Share And Publish option to create an MP4 movie file. Your animation is converted in Adobe Media Encoder, a freestanding application that is part of Adobe Creative Cloud (you'll learn more about Media Encoder in the Bonus Lesson in the Web edition of this book).

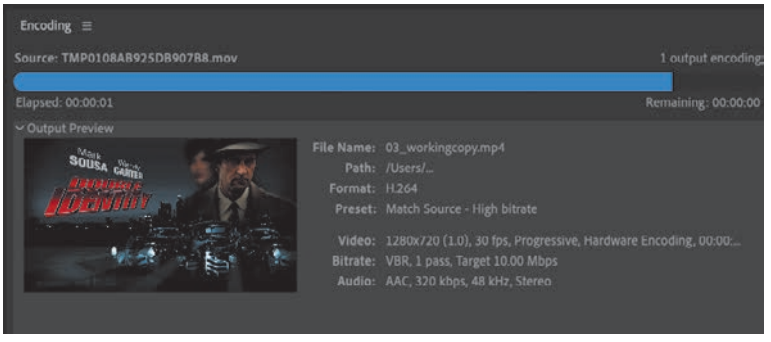
1 Choose Quick Share And Publish > Publish > Video (.mp4). Click Publish.



Adobe Media Encoder automatically launches, and your project is exported and added to the Queue panel for processing.

2 The encoding process will begin automatically. If it doesn't, click the Start Queue button (the green triangle) or press Return/Enter to begin the encoding process.

Media Encoder converts your project file into an H.264-formatted video with the standard .mp4 extension and notifies you when the process is finished.



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

Note You can also publish an MP4 movie by choosing File > Export > Export Video/Media. If you choose this route, you will have an opportunity to tinker with the options in Adobe Media Encoder and change audio/video encodings, cropping, trimming, and other properties of your video.

Review questions

1. What are two requirements of a motion tween?
2. What kinds of properties can a motion tween change in an ActionScript 3.0 document?
3. What are property keyframes, and why are they important?
4. How can you edit the path of an object's motion?
5. What does easing do to a motion tween?

Review answers

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

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