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# **LEARN**

# **Adobe Animate CC**

## **for Multiplatform Animations**

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**SECOND EDITION**

**Adobe Certified Associate Exam Preparation**

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Rob Schwartz



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## CHAPTER 4

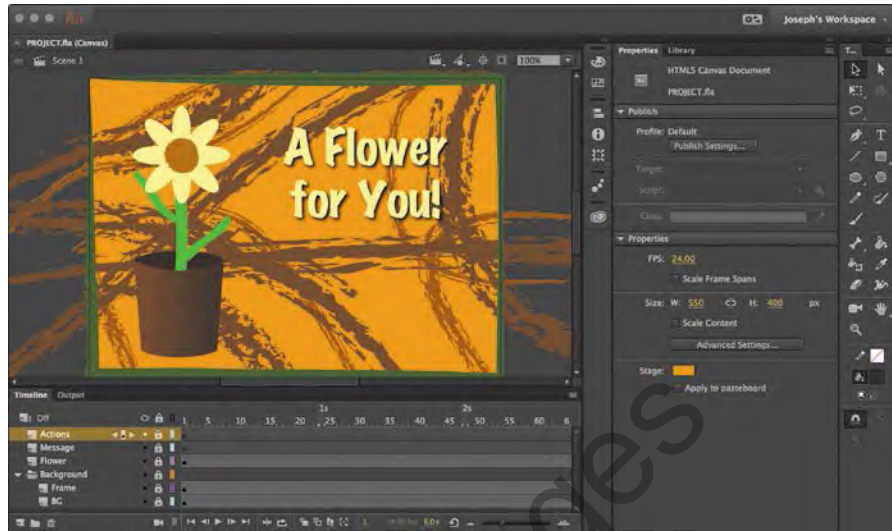
# Compose an Animated HTML5 Greeting

This chapter will build on everything you've learned so far, but we'll take things in a different direction from previous projects by authoring content that runs natively in the browser without the need for Flash Player. We'll also delve deeper into aspects of the library and symbols while introducing some new tools.

This project involves the traditional web-based greeting card (**Figure 4.1**), but with a twist: the client wants you to design the card in such a way that it can be accessed via a web browser on a desktop, mobile device, or other similar means. In other words, since the browser-based Flash Player is widely available only on desktop browsers, in order to hit mobile targets we'll need to deploy using a native **HTML5** target. Luckily, Adobe Animate CC includes a number of target-platform document types suited specifically to this task.

 **Video 4.1** Project Overview

**Figure 4.1** The greeting you'll create in this chapter



- ★ ACA Objective 1.4
- ★ ACA Objective 2.1

▶ **Video 4.2** *Creating a New HTML5 Canvas Document*

## Creating a New HTML5 Canvas Document

Content created in Animate CC can be published directly to a number of modern HTML5 formats, including **Canvas** and **WebGL**. The primary document type that allows this publish target is HTML5 Canvas. When creating content using this publish target, Animate CC leverages the CreateJS JavaScript libraries to output an entire animation or interactive project for the HTML5 canvas element.

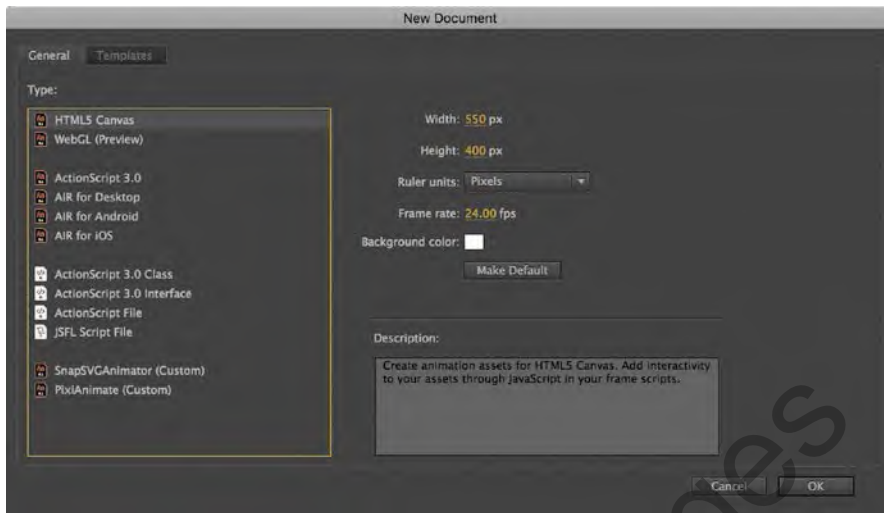
### Setting up the project document

The first thing you'll do is create a new document by doing one of the following:

- On the Welcome screen, select HTML5 Canvas as your document type.
- Choose File > New to open the New Document dialog box (**Figure 4.2**). In the Type list, select HTML5 Canvas.

#### NOTE

*The HTML5 canvas element is also used to display WebGL content.*






**Figure 4.2** The New Document dialog box

## CREATEJS

CreateJS is a suite of modular JavaScript libraries and tools that work together or independently to enable rich interactive content using open web technologies in HTML5. See [www.createjs.com](http://www.createjs.com) to learn more.

Animate CC opens a new document, which initially looks exactly the same as the documents we've already worked with. You should note a number of differences, however:

- First, notice that in the General tab of the New Document dialog box, the name of the file is appended with the (Canvas) qualifier. This lets you know that you're working in that particular document type. ActionScript-based projects have no such qualifier.
- A couple of tools in the Tools panel are disabled: the 3D Rotation tool () and the 3D Translation tool () .
- If you select the Text tool () , you'll notice that you can only choose Static Text or Dynamic Text. Input text Type is disabled.
- When viewing Document Properties, you'll see that a lot of options under the Publish area are disabled because they pertain only to ActionScript-based projects.

### NOTE

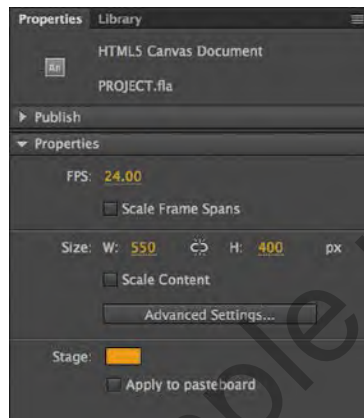
*The HTML5 canvas element is a structure through which bitmap data can be drawn and changed via JavaScript. It also includes the ability to process and respond to various modes of interactivity like mouse clicks and touch events.*

Otherwise, creating and animating content targeting HTML5 Canvas should be nearly identical to what you have already encountered.


## Preparing the Stage and timeline

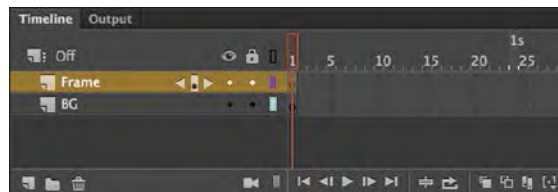
Before creating any assets in the greeting card project, you'll do some work on configuring the Stage and other project fundamentals.

- 1 In the Properties panel (**Figure 4.3**), set the Stage width to 550 pixels and the height to 400 pixels. This is the normal Animate CC default, so there may not be anything to change depending on your preferences.



**Figure 4.3** Configuring the Stage in the Properties panel

- 2 Make sure FPS is set to a value of 24 and choose a background color that suits you. I choose black most of the time, but in this project, I'll select a cheery orange color instead. You'll be drawing a background anyhow, so it doesn't matter all that much.
- 3 Moving on to the timeline, rename the present layer **BG**. This is where you will draw your project background.
- 4 Use the New Layer button () to create an additional layer and name it **Frame** (**Figure 4.4**). This layer will contain assets that make up the basic background elements of your project.



**Figure 4.4** Frame layer added

- 5 Save the document in a location that makes sense to you.

Even though you're using a different document type in this project, Animate CC treats the file the same way, even saving it in the same FLA file format.

## Laying Out the Background Elements



Now that you have layers for your frame and background assets, you can create these elements using the shape and drawing tools in Animate CC. You'll be using some of the vector tools you're already familiar with, but you'll also be introduced to the concept of variable-width strokes and the super cool Paint Brush tool.

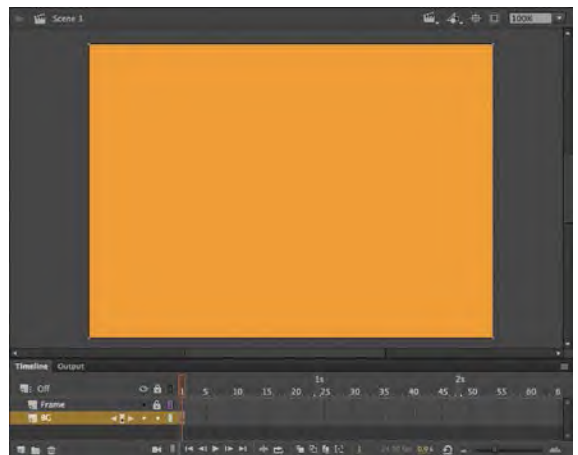
★ ACA Objective 4.1

### Drawing the background

To draw the background to the greeting card project, you'll use the new Brush Library and the Paint Brush tool in Animate CC.

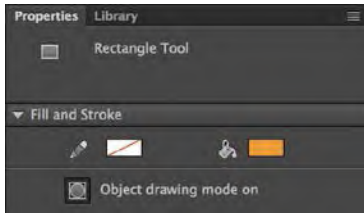
▶ **Video 4.3** *Drawing the Background*

- 1 To begin, lock the Frame layer to ensure that you don't draw anything in it by mistake.
- 2 Select the BG layer within the timeline and select either the Rectangle tool (  ) with Object Drawing Mode enabled or the Rectangle Primitive tool (  ).  
You're now ready to draw the background.
- 3 Drag from the top left of the Stage to the bottom right to draw a shape exactly the same size as the Stage: 550x400.
- 4 You may need to make some adjustments to the size and position of your shape, depending on your snap settings and how steady a hand you have. Do this from the Properties panel with the object selected.
- 5 If you haven't done so already, choose a background color for your shape. I'm using #FF9933 in the example shown in **Figure 4.5**, but you can choose whatever you like.



**Figure 4.5** I'm using an orange-ish background for my shape.





**Figure 4.6** No stroke color as represented in the Properties panel


- You don't need any stroke color for this project, so choose None for the Stroke color. It's represented in the color picker as the white block with the red diagonal line running through it (**Figure 4.6**).

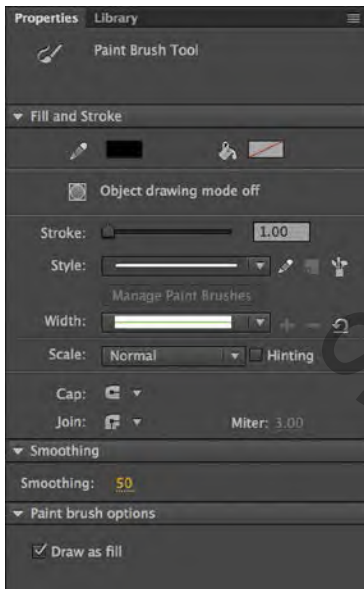
**NOTE**

You can always turn off stroke or fill by choosing None for either color value.

## Decorating with the Paint Brush tool

**Video 4.4**  
Decorating with Art Brushes

Now for some freeform fun! The Paint Brush tool () lets you draw out strokes with vector art attached to them. This allows for massive creative possibilities, whether you're using built-in brushes from the Brush Library or using custom brushes you created with the Adobe Capture CC mobile app and shared with Animate CC via the CC Libraries panel.



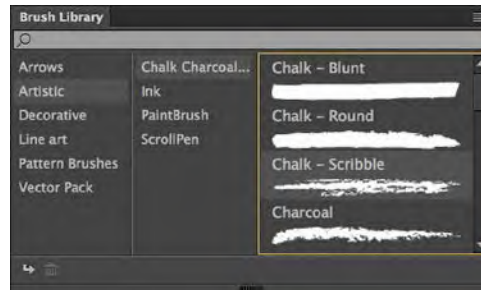
**Figure 4.7** The Properties panel with the Paint Brush tool selected

- To begin, select the Paint Brush tool from the Tools panel. The Paint Brush tool Properties panel opens (**Figure 4.7**). You'll be drawing these decorative assets in the BG layer.
- Choose Window > Brush Library to open the Brush Library.
- Find one you'd like to use and select it.

It should now show up in the Style area of your Properties panel.

You can see in **Figure 4.8** that I've chosen the brush named Chalk - Scribble from the Artistic > Chalk Charcoal category in the Brush Library.

Now it's time to get creative!



**Figure 4.8** The Brush Library

- Using the Paint Brush tool, drag across the Stage to generate freeform vector artwork. Don't make your art too busy, but don't hold back too much either. Make it interesting.

**TIP**

You may want to select the Draw As Fill option in the Paint Brush Options section of the Properties panel. This will draw out vector art as fill and not strokes. Selecting Draw As Fill will generally be more performant on slower systems since a good part of the rendering is already completed and the appearance does not need to be generated on-the-fly as with stroke-only.


- Select a Shape color. In **Figure 4.9**, I've chosen to use something a few steps darker than my background (#A35A12), but there's no reason you couldn't use a number of variations in color or even stroke width. You can control all these properties from the Properties panel with the Paint Brush tool selected.



**Figure 4.9** An artistic background

- Once you're happy with the results, lock the BG layer and unlock the Frame layer for the next step in this project.


## EDITING AND MANAGING VECTOR ART BRUSHES

You can also edit existing brushes by clicking the Edit Stroke Style icon (  ) in the Properties panel with the Paint Brush Tool selected. This allows even greater variation in how the vector art is mapped to your strokes.

It is also possible to use the Paint Brush Options dialog box to convert vector art brushes into pattern brushes (and vice versa). Pattern brushes are great for things like frames and borders.

To manage all the brushes within your document—or even save custom brushes to your Brush Library—click the Manage Paint Brushes button in the Properties panel with the Paint Brush tool selected.

**NOTE**

You can also access the Brush Library directly from the Properties panel by clicking the Brush Library icon (  ).

★ ACA Objective 2.6

★ ACA Objective 4.5

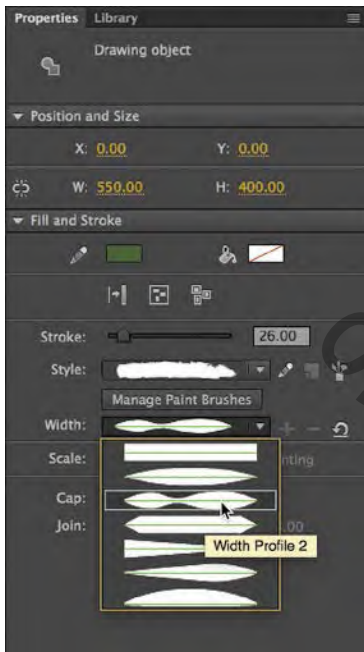
▶ **Video 4.5** Making a Frame

## Drawing the frame with variable-width strokes

Using variable-width strokes in your project is an easy way to impart a bit of controlled chaos to simple strokes. Animate CC will, in place of a linear stroke, impart a stroke whose width varies at certain points. The best way to grasp the concept is to use it. You'll create a nice frame for this project and apply a variable-width profile to the frame stroke.

- 1 Select the Frame layer so that you can draw the object. You may want to ensure all other layers are locked before proceeding.
- 2 Choose the Rectangle or Rectangle Primitive tool and draw a vector object the exact size of your Stage: 550px by 400px. Use whatever color you like for the stroke (in **Figure 4.10**, I'm using #336600), and choose a transparent fill.
- 3 With the object selected, choose a profile from the Width menu in the Fill And Stroke section of the Properties panel. If something doesn't look right, select the Width tool from the Tools panel and tweak existing width points or even create new ones.

- 4 For an additional creative flourish, apply a vector art brush to the variable-width stroke as well. In **Figure 4.11**, I'm using Artistic > Chalk Charcoal > Chalk - Round from the Brush Library and a stroke value of 26.



**Figure 4.10** Drawing Object Properties



**Figure 4.11** A little extra creative flourish added with a vector art brush

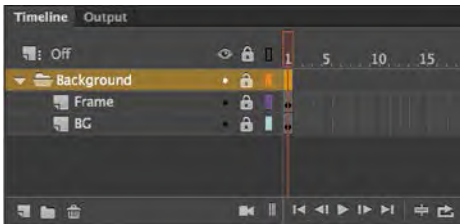
## GROUPING THE LAYERS WITHIN A FOLDER

★ ACA Objective 3.1

One of the best things you can do to keep things organized in your timeline is to group layers. You can accomplish this by creating a layer folder for specific sets of layers.

▶ **Video 4.6**  
Grouping Layers

- 1 Click the New Folder button below the layer stack on the bottom left of the timeline to create a folder to contain your static background elements.
- 2 Double-click the folder name and change it to **Background**.
- 3 Drag both the BG and Frame layers into the layer folder you just created (**Figure 4.12**).



**Figure 4.12** BG and Frame layers added to the new layer folder

With the folder created, you can now control the lock status, visibility, and outline mode for all layers from the folder itself. You can also collapse and expand the folder by using the small triangle beside the folder icon.


## Drawing the Flowerpot

Now that you've defined the static background elements for your greeting, you can begin work on the more complex, animated objects.


▶ **Video 4.7** Drawing the Flowerpot

## Creating and modifying a vector rectangle shape

You'll begin by drawing a simple flowerpot.


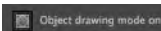

- 1 Create a new layer and name it **Flower**.
- 2 With this layer selected, select the Rectangle tool (). Don't select the Rectangle Primitive tool because in order for the shape to appear similar to the form of a flowerpot, you'll need to manipulate the shape.

**Video 4.8**  
Shaping with the  
Selection Tool

- 3 Draw a square about 120px by 120px. It doesn't have to be exact, and the color choices don't matter at this point. You don't have to include any stroke for this square.
- 4 Select the Selection tool (  ).
- 5 With nothing selected, hover the cursor along the top edge of your rectangle shape. Notice how the cursor changes to include a small arc. This indicates that you can bend the paths that define your shape by pulling and pushing the edges.
- 6 Pull down slightly on the top of the square to form a nice dip ( **Figure 4.13** ). This is the top of your flowerpot.



**Figure 4.13** Manipulating the shape

- 7 You need to create the inside of the flowerpot as well. Select the Oval tool (  ), activate Object Drawing Mode (  ), and draw an oval that matches the arc and size of the flowerpot top. The color you use should be a dark brown (#4B2500) since this portion of the flowerpot will be in shadow. Don't apply any stroke to this object.
- 8 Using the Subselection tool (  ), select the bottom-left anchor point of your shape.
- 9 With the point selected, use the arrow keys on your keyboard to nudge the point over a few pixels, creating a taper in your flowerpot. Perform a similar action on the other side.
- 10 To finish the flowerpot shape, select the Selection tool again and pull down the bottom of the shape slightly to give a little more perspective to the flowerpot, very similar to the modification you made to the top ( **Figure 4.14** ).



**Figure 4.14** Choose a dark brown for the inside of the flowerpot.



**TIP**

*Selecting Object Drawing Mode will ensure that overlapping shapes do not merge and cut into one another destructively.*

## Applying colors and gradients

★ ACA Objective 2.5

▶ Video 4.9 Using Gradients

Gradients in Animate CC always start as either centered radial **gradients** or horizontal linear gradients. You use the Gradient Transform tool () to recenter, rotate, or stretch a gradient. It's very similar to the Free Transform tool, but it affects only how the gradient is displayed. Access the Gradient Transform tool by clicking and holding the Free Transform tool icon () in the Tools panel.

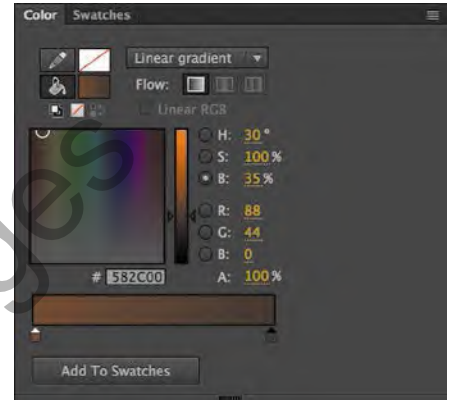
- 1 Use the Selection tool to select the flowerpot shape.
- 2 Open the Swatches panel and choose Linear Gradient from the color type menu.

By default, you'll see a gradient that runs from pure white to complete black.

- 3 Change this to run from a slightly lighter brown (#824000) to a slightly darker brown (#582C00) (**Figure 4.15**). Gradients often look best when there's a subtle change across the gradient.


If you want to preserve this color definition as a reusable swatch, click the Add To Swatches button to make it selectable from any Swatches panel within Animate CC. You can now select the flowerpot shape and easily apply the recently created swatch to the fill by using the color picker in the Properties panel.

Now that the gradient swatch is applied, you can use the Gradient Transform tool to adjust how the linear gradient appears on the flowerpot shape. When an object with a gradient applied is selected using this tool, you can adjust the rotation, center point, width, and more.



**Figure 4.15** The settings you choose in the Color dialog box should match the ones shown here.

### ABOUT TAGGED SWATCHES

A recent addition to Animate CC is the concept of tagged swatches. This allows you to choose a swatch from the Swatches panel and transform it into a tagged swatch by clicking the Convert To A Tagged Swatch icon () below the swatches grid. Tagged swatches differ from other swatches in that a small white tag appears in the lower right of a tagged swatch.

When you have a number of shapes using the tagged swatch, you can easily update the swatch and the changes will automatically cascade across all objects using that tagged swatch.

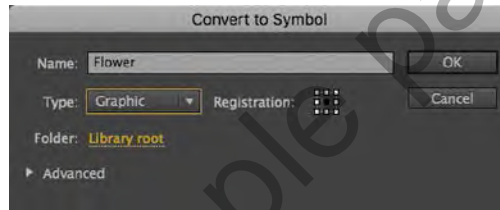
## Convert to a graphic symbol

**Symbols**, at their most basic level, serve as containers for artwork. They come in three varieties, each with unique characteristics that allow them to be used for animation and interaction. Keep in mind that although Animate CC refers to “converting” elements to symbols, you’re really wrapping the existing elements into symbols. Using symbols will allow nearly any graphical element to become a button, be animated in specific ways, or even be manipulated by code.

Creating a symbol from an existing set of elements is fairly simple. Here’s how.

- 1 Select everything on the Flower layer of the timeline and choose Modify > Convert To Symbol.

Once the Convert To Symbol dialog box appears, you’ll be given the option to type in a name for the symbol, select the symbol type, and specify a registration point alignment (**Figure 4.16**). There’s also an area to access advanced options that are used primarily for linkage as a class within ActionScript.



**Figure 4.16** The Convert To Symbol dialog box

- 2 Name the new symbol **Flower** and choose Graphic from the Type selection box. Click OK.

Once you click OK, the symbol is created and stored within the project library. Additionally, an instance of that symbol remains on the Stage, exactly where the conversion occurred.

## Types of symbols within Animate CC

You can create three different types of symbols within an Animate CC project: movie clip, graphic, and button. In this project, you’ve created a graphic symbol. The choice of which symbol type to use isn’t always clear, but learning more about each of these symbol types can help you choose the one that will work in your interactive media application.

### TIP

*It’s a good practice to always name your symbols with no spaces and no special characters and beginning with an uppercase letter. This has to do with how Animate CC views symbols, and it will simplify the process as you explore more advanced topics.*



## MOVIE CLIP SYMBOLS

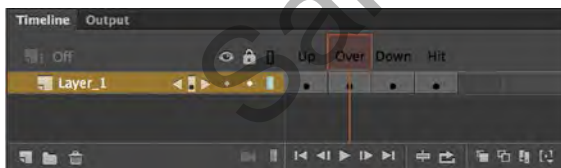
A movie clip symbol has a timeline that behaves like—but is completely independent of—the main Stage and is the primary symbol used when creating custom functionality within Animate CC. We'll see this use of movie clip symbols in greater detail during the later chapters. Movie clip symbols can be controlled with ActionScript or JavaScript as well as through timeline manipulation, making them extremely useful for customizing an interface.

## GRAPHIC SYMBOLS

Graphic symbols are fairly simple to create, and the operation of the symbol timeline is exactly the same as that of the main timeline. The main purpose of the graphic symbol is to create reusable graphical elements and simple animations in an efficient package.

## BUTTON SYMBOLS

Button symbols provide you with a quick and relatively simple way to create a standard interactive media button. These buttons can be created out of nearly any type of artwork, including other symbol instances, and can support a static or normal state, a rollover state, a down state, and a hit state. You construct the artwork for these states using keyframes, but rather than relying on frame numbers, the interface for construction of a button symbol uses Up, Over, Down, and Hit to identify where the keyframes for these states should be placed (Figure 4.17). We'll see this in detail as we work through the project in Chapter 8.



**Figure 4.17** The button symbol timeline

The hit state for a button symbol is not visible, but the artwork in the keyframe defines the clickable area of the button symbol. If a button symbol has no hit state, the current keyframe artwork is used to determine the clickable or live area of the button.

### NOTE

*If a button symbol has only a hit state, it is an invisible button that will show up in light blue during authoring time but will be invisible at runtime.*



# Editing the Flower Graphic Symbol

Symbols provide Animate CC projects with reusable elements that can be placed on the Stage as instances multiple times without recreating artwork. This approach can drastically reduce file sizes and can also simplify editing a layout by minimizing the number of graphic elements required to produce an interactive media project.

★ ACA Objective 2.4

▶ **Video 4.11**  
Editing Symbols  
and Symbol  
Instances

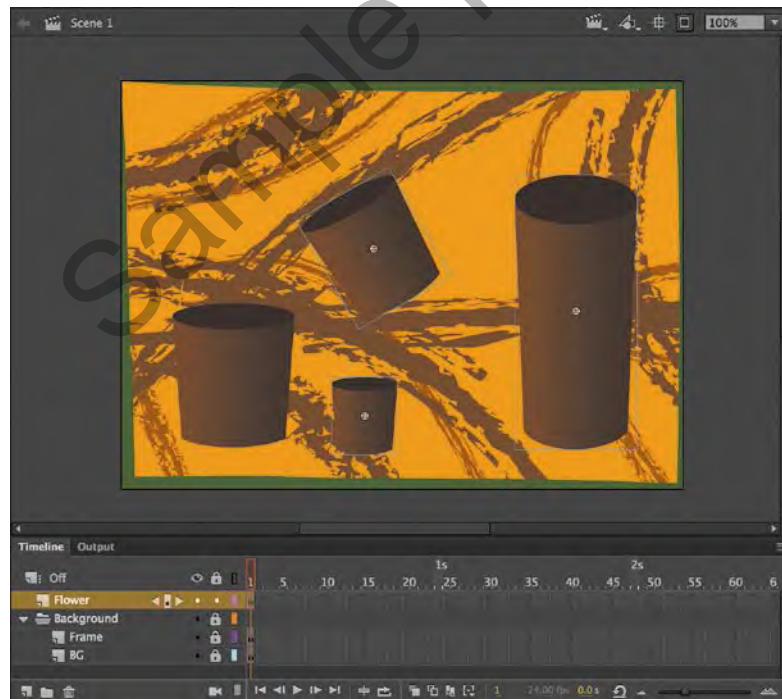
## Explaining symbols and instances

When a symbol is created, it resides in the project library. The symbol acts as a blueprint to instruct Animate CC on how to construct an instance of that symbol.

**Instances** are representations of the symbol that exist on the Stage and timeline. When you drag a symbol from the Library panel to the Stage, you're creating an instance of that symbol. You can have multiple instances of a single symbol on the Stage (**Figure 4.18**). If you edit the symbol, all the instances will change as well.

This feature can be effective for making changes globally in an Animate CC project. However, it can also be frustrating if you want each instance to be slightly different.

**Figure 4.18** You can have multiple instances of a symbol on the Stage.



Fortunately, symbol instances can be more than exact copies of the original symbol definition in the Library panel. You can modify the individual properties of each instance using the Properties panel or tools such as the Transformation tool. These property changes affect only the selected instance, not the original symbol definition.

Embedding additional symbols and elements within a symbol definition can also provide a means of customizing each instance using code. A common application is to include a dynamic text field within a symbol definition. With some simple programming, you can alter the content of this text field at the instance level. The nesting can get a bit complicated, but having only a single element in the library can make it worth the trouble if you ever need to make global changes.

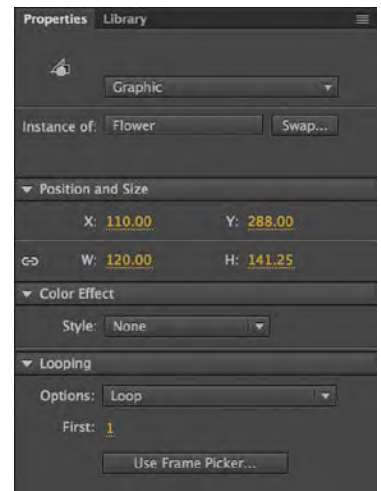
## Differences between movie clip symbols and graphic symbols

Movie clip and graphic symbols look very similar in the Animate.CC authoring environment, but big differences between them exist. The first has to do with the synchronization between the symbol timeline and the main movie timeline.

A graphic symbol is linked to the main timeline, whereas a movie clip symbol is an independent object whose timeline runs independently of the main timeline. If the main timeline is changing frames, so is the graphic symbol. If the main timeline is paused, the graphic symbol (which is linked frame by frame) is paused too. The movie clip timeline isn't bound to the main timeline and runs completely independently.

Another difference involves the use of ActionScript and JavaScript. Using code, you can access and control movie clip instances through the instance name assigned in the Properties panel. The graphic symbol has no option to assign an instance name and is not accessible via code as an object (Figure 4.19).

A performance difference exists as well. Graphic symbols require less processing. Even with this advantage, many interactive media developers make nearly every object a movie clip, just to increase the flexibility of the use of the object, though animators often prefer graphic symbols for the ability to specify the presented frame being shown at any time via the Properties panel.



**Figure 4.19** The Properties panel with a graphic symbol instance selected

## Editing the flower symbol

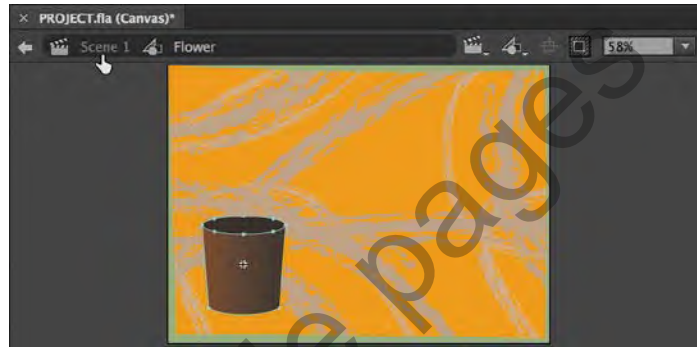
**Video 4.12**  
Preparing the  
Symbol

You can edit symbols by double-clicking any instance of the symbol on the Stage or double-clicking the symbol within the Library panel.

- 1 Double-click the symbol instance you created to edit it in place.

When the symbol opens, notice that a breadcrumb trail showing the hierarchy of the object shows up in the top-left corner of the Stage. You can leave the editing mode by clicking the scene name in this breadcrumb trail (**Figure 4.20**).

**Figure 4.20** Clicking Scene 1 in the breadcrumb trail will return you to the main timeline.



Now that you're operating within the symbol, notice that the symbol itself has its own timeline. In an Animate document, each symbol, no matter the type, has its own timeline. This allows for a great range of creative possibilities.

The next thing you'll do is to manage this internal timeline a bit better. Because you already have a number of objects within this symbol, you can place each of them on its own layer.

- 2 Select all the objects on the Stage either by dragging a selection rectangle around them with the Selection tool or by giving the Stage focus and using the Select All shortcut, Cmd+A (macOS) or Ctrl+A (Windows).

### NOTE

*It doesn't matter if you double-click the symbol within the Library panel or use the edit-in-place option of double-clicking an instance on the Stage. You're still editing the base symbol—not the individual instance. This means that any changes you make will be made to all instances of that symbol. This doesn't matter much in this case, since you'll be using only one instance of this symbol.*

- 3 With all of your elements selected, right-click them and choose Distribute To Layers from the menu (Figure 4.21).

This takes each object and creates a new layer for it and then empties the previous layer of all selected content. The original layer is empty, as indicated by a blank keyframe.

- 4 Delete the original, now empty layer, by selecting it and clicking the Delete Layer icon (🗑️) beneath the layer stack in the timeline.

Both the flowerpot shape and the darker, inner pot shape should now be on separate layers.

- 5 Rename the main pot shape **pot**, and rename the layer representing the inner, backside of the flowerpot **potback**.
- 6 Ensure the topmost layer is pot and that potback is directly beneath it. Lock these layers before moving on.

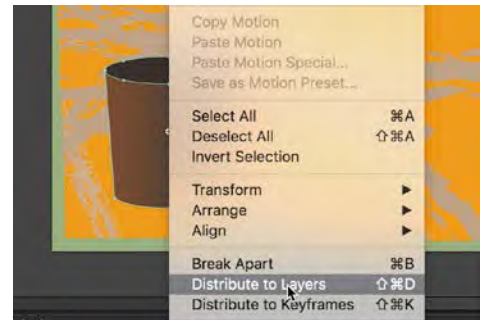



Figure 4.21 Choosing Distribute To Layers

## Drawing a flower stalk

For the stalk of the flower, you'll create a simple shape with the Brush tool (🖌️) so that it isn't completely straight and appears a bit more natural. The Brush tool is a freeform tool that draws shapes composed of fill alone.

 **Video 4.13**  
Drawing the Stalk

- 1 Create a new layer and name it **stalk**.
- 2 Place this layer between the pot and potback layers by dragging the new layer into position (Figure 4.22). Now the order from top to bottom should be pot, stalk, and potback.

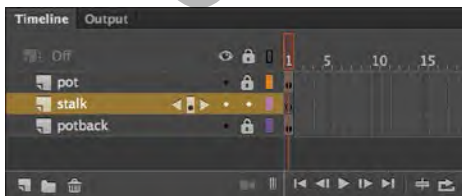
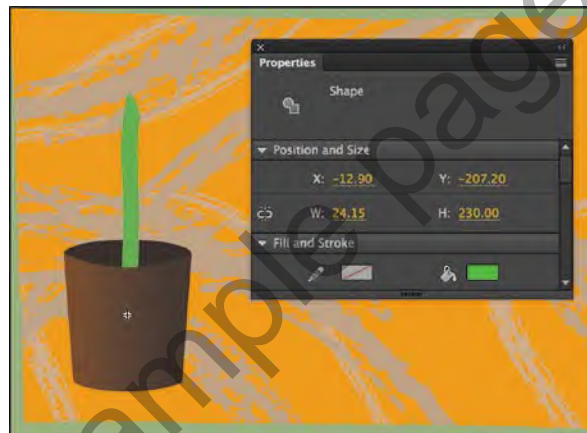


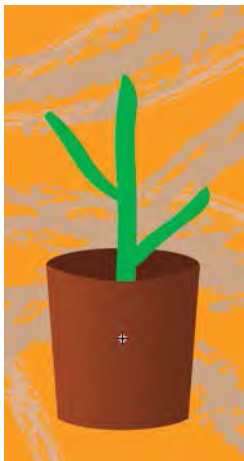
Figure 4.22 Place the Stalk layer in the middle of the layer stack.

- 3 Select the Brush tool (🖌️) and look at the Properties panel.

- 4 Choose a nice green color (#32CC32) for your fill and look to the Brush Shape area of the panel to see the brush size and shape options. Select a round brush and bump the size way up to a value of 14 or so for a thick stalk.
- 5 Keep Object Drawing Mode off for now. Since we are drawing the stalk shapes on their own layer, we do not need to worry about interaction with the other elements.
- 6 Draw the primary stalk beginning behind the shape on the pot layer and extending up. If you like, you can draw a straight shape by holding down the Shift key as you draw, though it may look more natural if you freehand it. You may wish to adjust the Smoothing value to assist in getting the desired look—a value of 75 works pretty well for this. The stalk, when complete, should measure about 230px in height (Figure 4.23).



**Figure 4.23** Set stalk parameters in the Properties panel.



**Figure 4.24** The fully realized stalk shape

Before moving on, we need to define some secondary stalks on either side of the primary stalk that was just drawn.

- 1 Select the Brush tool again and reduce the Size value to 10.
- 2 Move down a third of the way from the top and draw out a stalk emerging from the left side.
- 3 Go another third down and draw another stalk emerging from the right.

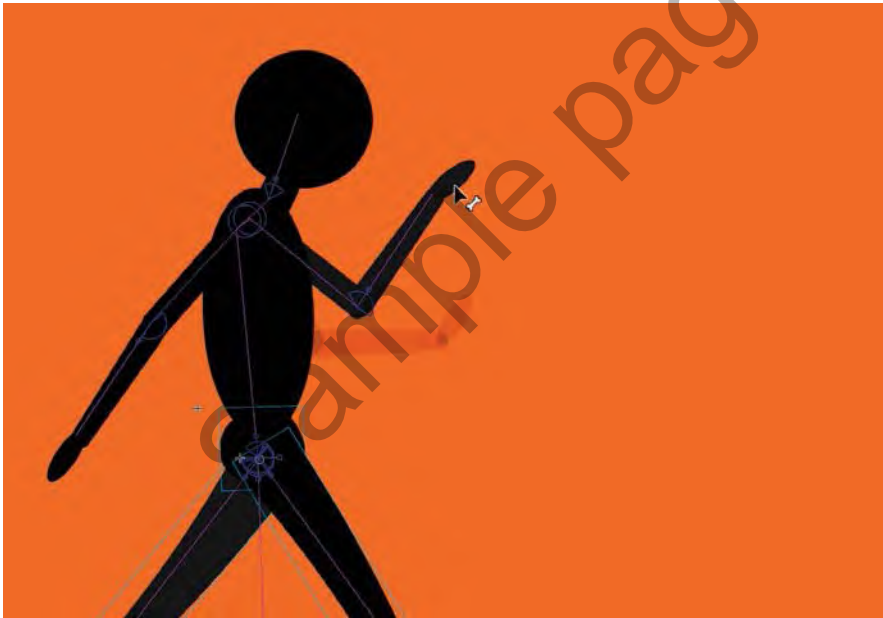
You will now have drawn a long, primary stalk for the flower, which includes two branching stalks on either side (Figure 4.24). Don't worry if things look unnatural at this point; we'll be able to pose all of the stalk elements more naturally with inverse kinematics!

# Animating the Flower Stalk with Inverse Kinematics

**Inverse kinematics** allows you to animate objects in Animate CC using a series of bones chained into linear or branched armatures in parent-child relationships. This means that when one bone moves during an animation, that connected bones will also move in relation to it. Inverse kinematics is a unique way of animating content to create natural motion.

★ ACA Objective 4.4

To animate using inverse kinematics, specify the start and end positions of bones on the timeline. These positions are known as “poses” in Animate CC. The armature will be automatically adjusted to tween positions of the bones in the armature between poses (Figure 4.25).



**Figure 4.25** Animating an armature using inverse

You can apply inverse kinematics within Animate CC in one of two ways: by drawing bones within a single shape or through the construction of an armature composed of multiple movie clip symbol instances. In this project, you’ll create a shape-based armature from the flower stalk you just created.

## Animating the flower stalk using an armature layer

**Video 4.14** Using the Bone Tool


### TIP

When drawing bone segments, you'll find it helpful to disable all snapping and also zoom the stage for more precise placement. You can also turn off the visibility for layers that may obstruct your view.

Your next step is to animate the stalk growing up and out of the flowerpot. To do this, you'll take advantage of the armature you've already created. You don't need to specify any sort of tween when working with armatures; Animate CC will handle all of this automatically once different poses are defined.

- 1 First, you'll need to extend your frame span to the 6-second marker. To do so, move the playhead to frame 144, select the frames across all layers, and choose Insert > Timeline > Frame.

These frames will provide enough time to nicely animate the growth of your stalk and will allow for some automated "springiness" once the animation has concluded. Bring the playhead back to frame 1 when finished.

- 2 Select the Bone tool (  ) from the Tools panel. You'll use this tool to define the bones within your armature.
- 3 To define a bone, drag a short way from the bottom of the stalk to the first branching stalk ( **Figure 4.26** ). You will draw subsequent bones across the shape by pressing the mouse button over the end point of the previous bone and dragging out a new segment.



**Figure 4.26** Defining the initial bone



- 4 Draw about three or four bone segments along the central stalk to the top. Try to have each joint (the juncture between each bone) aligned with one of the secondary stalk elements.
- 5 We will now branch our armature out across the secondary stalk segments. For each joint closest to a secondary segment, pull out more bones to define those segments as part of the armature. Each secondary stalk segment should have about three bones apiece (Figure 4.27). The reason for creating many bones is to increase flexibility and refine the range of motion.

Notice how the stalk layer is now empty? A new layer named `Armature_1` now exists above it with the frames colored light green, and the icon is a small figure. These changes indicate that this is a new armature layer (Figure 4.28).

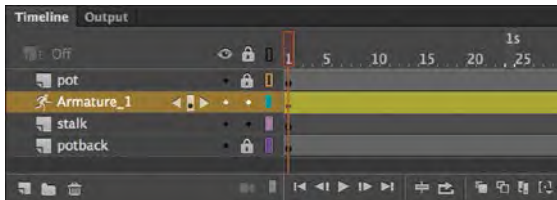


Figure 4.28 The light green layer color indicates an armature layer.

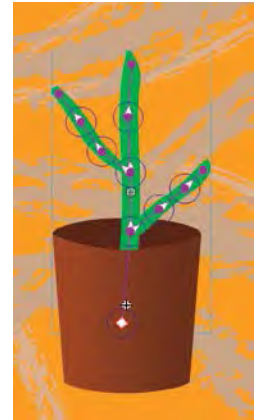


Figure 4.27 The completed armature extends across all stalk segments.

Because you're using an armature, all you need to do to modify your pose is to drag with the Selection tool. Try it out! Notice how everything naturally moves in relation to any portion of the stalk you click and drag? This is the power of inverse kinematics.

Once an armature is assembled, it has a default pose. When you modify a property on any particular frame, it's called a *pose*. Poses can be copied for easy modification and reuse. You want your ending frame to contain a pose with the stalk fully extended.

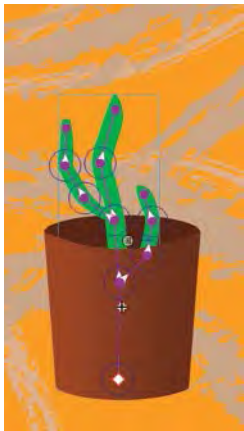
- 1 Let's go ahead and delete the existing stalk layer—it is no longer needed. Rename the armature layer to **stalk**, for clarity.
- 2 Select frame 48 (the 2-second marker) on the armature layer and right-click. Choose `Insert Pose` from the menu to duplicate the pose from frame 1. The flower stalk will remain completely opened within this second pose.
- 3 Return to frame 1 and use the Selection tool to modify the initial pose so that the secondary stalk segments are much closer to the main stalk. They will spread out as the main stalk becomes taller.
- 4 Now, pull the main stalk slightly to the side in order to introduce further differentiation between poses (Figure 4.29).

[Video 4.15](#)  
Managing  
Armature Poses



Figure 4.29 The pose for the emerging stalk





**Figure 4.30** The completed pose for the initial stalk

- 5 Use the Selection tool to select the entire plant.
- 6 Use the arrow keys to reposition the entire stalk down into the flower pot a bit. It's fine to have most of it sticking out, but we want to give the illusion of growth and this will help (**Figure 4.30**).

If you preview the animation between frames 1 and 48, you'll see that Animate CC performs a special armature tween between these two poses. The stalk begins with its branches very close to the main stalk and is seated low in the pot. The secondary stalk branches spread outward as the primary stalk appears to grow taller.

This is nice...but working with inverse kinematics allows us to add in a bit of dynamic animation as well—by applying values of Strength and Damping to each bone segment's Spring property. We have allowed a few extra seconds in the timeline beyond the 2-second mark for this very purpose.

**TIP**

*You can also use inverse kinematics to construct an armature out of multiple movie clip instances. This is useful when building an armature for a human form or something mechanical in nature. Shape-based armatures are more suited to plants with long swaying stalks or creatures like snakes.*

## Adding Spring to the armature animation

**Video 4.16**  
Applying Spring  
to Your Bones

The stalk animation runs for only two seconds at the moment, but by adjusting the Spring properties for various bones, we are able to dynamically generate additional, subtle movements based on inverse kinematics.



**Figure 4.31** Stalk bones farthest from the main stalk should be very springy.

- 1 Zoom in about 200 percent so that it is easy to manipulate the armature. We'll focus on one of the secondary stalk segments for now.
- 2 Each secondary segment should have three bones defined across its length. Using the Selection tool, click the bone that is farthest from the main stalk. The bone is now selected and appears highlighted.
- 3 In the Properties panel, in the Spring section set Strength to 90 and Damping to 2 (**Figure 4.31**).