

Flash Introduction

Academic Computing Services
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Abstract: This document introduces the basic animation features of Macromedia Flash MX 2004, including the drawing tools, the stage, the timeline, symbols, and a number of fundamental animation techniques.

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Introduction

Macromedia Flash opens up an entirely new dimension within the realms of the Internet. No longer is one confined to the newspaper-like, flat nature of websites. Websites that were once stark, boring, and lifeless can now literally jump out and excite all of one's primary senses. This breakthrough in delivering dynamic multimedia over narrow bandwidths provides a new perspective on how we interact with websites, and ultimately, how we organize content and information itself. Flash, as an authoring tool, is limited only by our vast imaginations, and its mastery is within grasp of all those who wish to put in effort and practice.

Think back and try to remember which websites have intrigued you the most, or which websites left the best impression on you? Creative graphics, catchy color schemes, and flashy animation (pun intended) seem to stand out above the rest. After analyzing a multitude of Flash movies, you should begin to see a trend or a style that is consistent with most Flash movies – they use text and text transitions along with an array of quick snapshots and sounds to keep you mesmerized. Many of us should be able to easily identify a Flash animation, and this identification skill is important because it will help establish what the scope and limits of Flash are.

Note: Please note that instructions and screen captures in this documentation are taken from the Windows version of Flash MX 2004. The Macintosh version of Flash MX 2004 should be highly similar. If you have any questions about the Macintosh version of Flash, please consult the manual.

Objectives

This documentation will give you the information you need in order to create simple, interactive animations in Flash. Topics covered include basic drawing tools and the drawing environment; animation control using the timeline; frame-by-frame, shape tween, and motion tween animations; simple animation control using ActionScript; importing graphics into Flash; and publishing Flash animations in various formats.

Prerequisites

You will need to be familiar with graphic editor programs, such as Adobe Photoshop. ACS periodically offers workshops on Photoshop at the Introduction and Intermediate levels. Check the ACS workshop calendar (www.ku.edu/acs/calendar) for currently scheduled dates and times. In addition, familiarity with vector drawing programs and basic animation techniques will be beneficial to learning Flash.

Related Training Available from ACS

All workshops offered by Academic Computing Services (ACS), a division of Information Services, are free to KU students, staff, faculty, and [approved affiliates](#). The general public is also welcome to most workshops, but some ACS workshops require a [registration fee](#) for them.

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To learn more about or register for workshops, receive automatic announcements of upcoming workshops, and track workshops you've registered for and have attended, visit the ACS Web site at www.ku.edu/acs/train. You can also check our online schedule at www.ku.edu/acs/schedule for a list of class offerings and their availability. For further workshop related questions, please email training@ku.edu.

Definitions

Term	Definition
ActionScript	Adds interactivity and/or playback efficiency to a movie via coding. Similar to JavaScript, ActionScript is an object-oriented programming language.
Alpha effect	Adjusts the transparency of an instance.
Bitmaps	Images using colored dots, called pixels, arranged within a grid. Typical of most web graphics.
Breaking apart	Converts symbols into basic shapes so that shape tweening can be used.
Button symbol	Used to create interactive buttons in a movie that respond to mouse clicks or other actions.
Component	A pre-made movie clip that provides some functionality, such as a button, a scroll pane, or a progress bar. Components allow you to create animations with complex functionality, but with a minimum of effort.
Easing option	By default, the rate of change between tweened frames is constant. Easing creates a more natural appearance of transformation by gradually adjusting the rate of change.
Frame-by-Frame animation	An animation technique that involves subsequently creating a slightly altered image in sequence and then playing back the entire sequence.
Graphic symbol	Used for static images and to create reusable pieces of animation that are tied to the Timeline of the main movie.
Keyframe	A frame in which a change in an animation is defined. Keyframes are an important part of tweened animation.
Layer	Helps organize symbols and other separate animation entities by allowing you to draw and edit objects on one layer without affecting objects on another layer.

Term	Definition
Library	Stores symbols, such as graphic symbols and button symbols, and allows you to view and organize these files as you work. Helps in selecting and copying instances of symbols on the main stage.
Motion guide	Lets you draw paths along which tweened instances, groups, or text blocks can be animated from one keyframe to another.
Motion tweening	To tween the changes in properties of instances, groups, and type, you use motion tweening. Flash can tween position, size, rotation, and skew of instances, groups, and type. Additionally, Flash can tween the color of instances and type, creating gradual color shifts or making an instance fade in or out.
Shape tweening	In shape tweening, you draw a shape at one point in time, and then you change that shape or draw another shape at another point in time. Flash interpolates the values or shapes for the frames in between, creating the “morphing” animation. Symbols must be broken apart before using shape tweening.
Symbol	A reusable graphical object that is stored in a Library. You can then create multiple instances of the symbol. There are three symbol types: graphic, button, and movie clip.
Timeline	Organizes and controls a movie's content over time in layers and frames. The major components of the Timeline are layers, frames, and the playhead.
Vector graphic	Describes images using lines and curves, called vectors, which also include color and position properties. You can move, resize, reshape, and change the color of a vector graphic without changing the quality of its appearance.

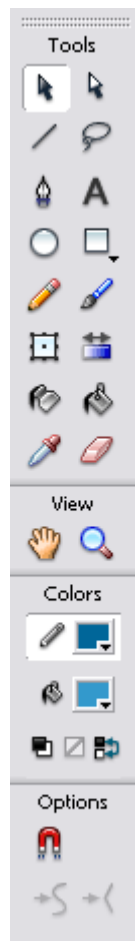
Using Flash


When you first open Flash, you will notice that it resembles other graphic editing programs you may be familiar with, such as Adobe Photoshop. At its basic level, Flash is a drawing program, and in order to use the more advanced features of Flash, basic drawing tool functions must be learned.


Open Flash, if it is not already open. In the default layout, you will see several **panels** around the center of the drawing canvas, or **stage**. On the left is the **Tools** panel, along the bottom is the **Properties**, **Actions**, and **Help** panels, and along the right are such panels as **Components**, **Color Mixer**, and **Component Inspector**. Except for the Tools panel, you can click on the title of any panel to collapse it, and you click on the gripper next to the title to drag the panel around, allowing you to rearrange your panel sets to suit your work patterns. You can hide and show the various panels available in Flash by selecting them Window menu (or under the Design Panels, Development Panels, and Other Panels submenus of the Window menu).


Basic Tools


There are many basic drawing tools available in Flash. Each is detailed below. Also note that many of these tools have additional options or modes that can be changed in the **Options** area of the Tools panel.





 The first important tool is the **Selection tool**. This tool is used to make selections on objects and graphics on the drawing area, or stage. You can either click on individual objects to select them, or click and drag to make a rectangular region and select all the objects in it. Once you make a selection, you may perform subsequent actions that affect your selection, such as moving it around the stage, deleting, or altering it in the Properties panel. Hold down the SHIFT key to select multiple individual objects.

 The **Subselection tool** is used for selecting and modifying anchor points on curves and lines. Clicking once on a line or curve with the Subselection tool reveals the anchor points. Anchor points are represented either by a hollow square (a corner point), or a hollow circle (a curve point). Clicking on an anchor point with the Subselection tool will select that anchor point (then represented by a filled square or circle). You can then click and drag the anchor point to move it, ALT-click and drag on a corner point to convert it to a curve point (and thus reveal anchor point tangent handles), or ALT-click on a curve point to convert it to a corner point (and thus remove the tangent handles).

 The **Line tool** is an important drawing tool. It functions like the line tool in other drawing programs. To use it, click on the stage, drag, and release to draw a straight line. Stroke width, style, and color can be changed in the Properties panel. Hold down the SHIFT key while dragging to constrain the line angle to increments of 45°.

 The **Lasso tool** can be used to select objects on the stage. It allows you to create a freeform selection area by clicking and dragging around an area. When you release the mouse button, Flash automatically completes the loop with a straight line.

 The **Pen tool** is used to create precise paths that are either straight lines or smooth curves. Stroke width, style, and color, and fill color (for closed paths) can be changed in the Properties panel. To use the Pen tool to create straight lines, click anywhere on the stage to define the first anchor point, click again where you want the first segment of the straight line to end (hold down the SHIFT key to constrain the line to increments of 45°), and continue clicking to create more straight line segments. Double click the last point to end the line segments (and create an open curve), or click on the first point you created to close the curve. To create curved lines, follow the same procedure, but instead of simply clicking to create each point, click and drag in the direction you want to curve to go.

 The **Text tool** allows you to draw text on the stage. Position the cursor on the stage where you want to begin your text and then click and start typing. The text font, size, color and paragraph formatting can be changed in the Properties panel.



The **Oval tool** allows you to create ovals of any shape and size (including circles). Stroke width, style, and color, and fill color for ovals can be changed in the Properties panel. To create an oval, simply click and drag across the stage to create the oval as you want it. Hold down the SHIFT key while dragging to constrain the oval to a circle.



The **Rectangle** and **PolyStar tools** allow you to create rectangles and polygons. To switch between the Rectangle and PolyStar tools, click and hold the tool icon on the Tools panel, then select the desired tool from the menu that appears. Stroke width, style, and color, and fill color for rectangles and polygons can be changed in the Properties panel. In addition, for the PolyStar tool, the number of sides of a polygon, or points on a star, can be changed by clicking on **Options** in the Properties panel. To create a rectangle or polygon/star, simply click and drag across the stage to create the shape as you want it. While using the Rectangle tool, hold down the SHIFT key while dragging to constrain the rectangle to a square. While using the PolyStar tool, hold down the SHIFT key to constrain the orientation of the polygon or star to increments of 45°.



The **Pencil tool** is used to create lines and shapes on the stage in much the same way you would use a real pencil. Stroke width, style, and color can be changed in the Properties panel. To use the Pencil tool, click and drag across the stage to create a line. Note that you can end your drawing at the same place you started, but the shape you create is not filled in. Hold the SHIFT key while dragging to constrain the line to a horizontal or vertical direction.



The **Brush tool** is used much like a paint brush. Click and drag across the stage to paint. The fill color can be changed in the Properties panel. Note that no stroke is produced when using the brush tool. Under the Options section of the Tools panel, you can change the brush size and shape.



The **Free Transform tool** can be used to transform objects in a variety of ways. To use the tool, click on an object on the stage to reveal transform handles. Then, under the Options section of the Tools panel, choose the type of transformation you want to perform. Options include Rotate and Skew, Scale, Distort, and Envelope. Hold down the SHIFT key while rotating to constrain the angle to increments of 45°.



The **Fill Transform tool** allows you transform gradient and bitmap fills. To use it, click on an object that has a gradient or bitmap fill to reveal transform handles. Click and drag the circle handle in the center of the fill to move the gradient or bitmap. To change the width or height of a bitmap fill, or the scale of a gradient fill, click and drag the square handle along the edge of the fill bounding box. To rotate the fill, click and drag the circle handle on the corner of the bounding box. To change the radius of a circular gradient fill, click and drag the middle circle handle on the bounding circle of the fill.



The **Ink Bottle tool** allows you to change the stroke color, width, and style of lines and shape outlines. To use it select the stroke width, style, and color you want to apply in the Properties panel, and click on one or more lines or shapes on the stage to apply the stroke properties to them.



The **Paint Bucket tool** allows you to fill enclosed areas with color. To use it, select the solid color or gradient you want to apply in the Properties panel, and click on one or

more enclosed shapes on the stage to fill them with color. Note that under the Options section of the Tools panel, you can choose how you want Flash to handle partially enclosed areas.



The **Eyedropper tool** allows you to copy stroke and fill properties from one object to another. To use it, click on a stroke or fill of the object whose properties you want to copy. If you click on the fill, the Eyedropper tool automatically changes to the Paint Bucket tool, with fill properties set the same as the object you clicked on. If you click on the stroke, the Eyedropper tool automatically changes to the Ink Bottle tool, with stroke properties set the same as the object you clicked on. Now click on one or more objects on the stage to apply the stroke or fill properties.



The **Eraser tool** allows you to erase objects on the stage. To quickly erase everything on the stage, double click the Eraser tool icon on the Tools panel. Note that you can change erasing options in the Options section of the Tools panel.



The **Hand tool** is used for moving the view of the stage. It is especially useful when you have used the Zoom tool to magnify the stage. To use it, simply click and drag the stage in the direction you want it to move. To temporarily switch between another tool and the Hand tool, hold down the spacebar and click the Hand tool in the Tools panel. When done dragging, Flash will return to the tool you were using.



The **Zoom tool** is used for magnifying or reducing the view of the stage. To use it, click anywhere on the stage to zoom in by a factor of two. Alternatively, you can click and drag to zoom into a region of the stage. Hold down the ALT key while clicking to zoom out by a factor of two.



In addition to the drawing and view tools, the Tools panel allows you to modify the colors that are used to draw strokes and fills. The **Stroke color** is applied to lines and shape outlines. The Line, Pen, Oval, Rectangle, PolyStar, and Pencil tools all produce a stroke. The **Fill color** is applied to the interiors of shapes. The Pen (for closed paths), Oval, Rectangle, PolyStar and Brush tools all produce fills.

Practice using the various drawing tools on the stage and note the behavior of each tool that you use. Remember, you can quickly delete everything on the screen by double clicking the Eraser tool.

Vector Graphics

As you practice drawing several shapes and pictures with the basic tools, notice how smooth everything seems to look, especially after you have tried to draw with the Pencil tool. Shapes and drawings are smooth in Flash because Flash is a vector-based drawing program. Vectors are mathematical representations of lines and shapes and are not the same as other images you see, such as digital photographs.

When you zoom into a photograph using a graphics editor program, you will eventually see blocks, or pixels, of color that make up the picture. A rounded shape will look progressively less rounded and more jagged as you zoom in closer. When you zoom in on a circle in Flash, however, you will never see the jagged edges because each progressive zoom redraws the circle using the vector equations. Vectors minimize storage space for images by eliminating the need to store color information for a huge

number of pixels (the average digital camera will produce pictures that have over a million pixels). Instead, only the vector equation is stored and graphics are calculated and displayed by using this equation.

Even though vector-based graphics require a relatively small storage space, they require a significant amount of computation to manipulate the vector equations. Therefore, the simpler your Flash animation (i.e. the fewer points, edges, corners, etc.) the better the animation will run, especially on older or less powerful computers.

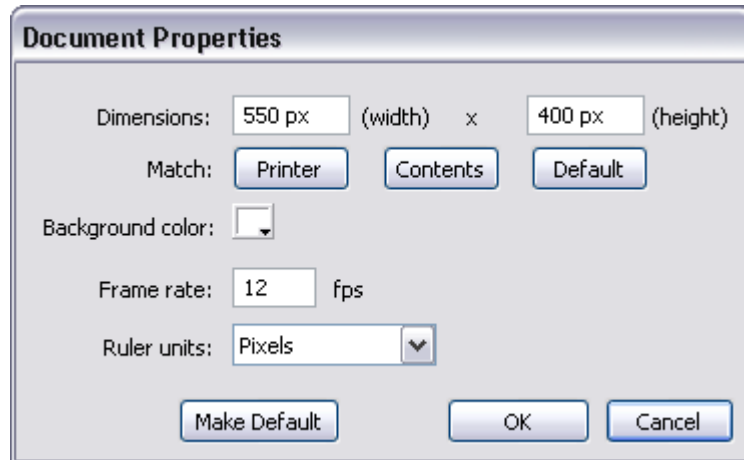
There are some techniques that will help you achieve simpler animations in Flash. The Selection tool, for example, has options under the Options section of the Tools panel that allow you to simplify lines and curves in your drawing by making them smoother or straighter. The more you click on this option, the more smooth or straight your image becomes.



Simplifying options for the Selection Tool (smooth and straighten)

Stage Elements and Properties

The stage is the main working area for your drawings and animations. Anything on the stage will show when you play your movie, and anything off the stage will not appear in the movie. To set the stage and movie properties, press **CTRL-J** to access the **Document Properties** window. Here, you can set the frame rate of your movie, the dimensions of your movie in pixels, and the default background color of your movie. Keep in mind that the higher the frame-rate of your movie, the smoother it will play.



Document Properties window

- 12 frames per second is sufficient for most Flash projects. For higher quality animations, 30 frames per second can be used.
- The default Flash movie dimensions are 550 pixels by 400 pixels. This can be adjusted to suit your larger web page. For example, Flash animations are often used in combination with HTML elements on a web page and you may need to change the size of the Flash animation to fit properly with the layout of the rest of the page.

- Choose a background color that will be easy to work with, or set the background color after you are done with your Flash movie – you don't want to stare at a high intensity color for too long while working.

Property is a concept that is frequently encountered in Flash. An object or item contains sets of parameters that are configurable at any time. For instance, when you draw a red circle on the stage, it has:

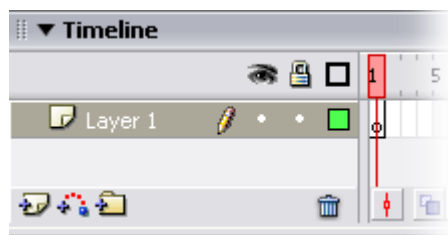
- a fill color property of red
- a height and width property
- a rotation property of 0 degrees
- a stroke width property of 1 pixel, and so on.

You can view the properties of any object on the stage in the Properties panel by selecting the object with the Selection tool. The type of object selected will affect the variety of properties that you can modify. Some properties only apply to symbols, a topic discussed below.


Layers


Flash provides a way to create layers in your animation. Using layers, you can organize the contents of an animation and separate different objects or groups of objects. As you work with your animation, you can hide layers to prevent the stage from getting cluttered and unwieldy, and / or you can lock layers to prevent accidental changes to the objects on them. Overall, layers are a very useful tool in organizing the objects in your Flash movie, and, particularly in the case of some animation techniques, are required for the animation to work properly. Never be concerned with creating too many layers; having too many layers is better than having too few.

The layers are shown as a stacked order in the layers section of the Timeline panel, meaning that they are all physically stacked on top of one another on the stage. A higher-positioned layer will cover anything below it. Objects on lower-positioned layers will not be visible if there is a shape in a higher layer that is drawn on top of it.



The layers section of the Timeline panel

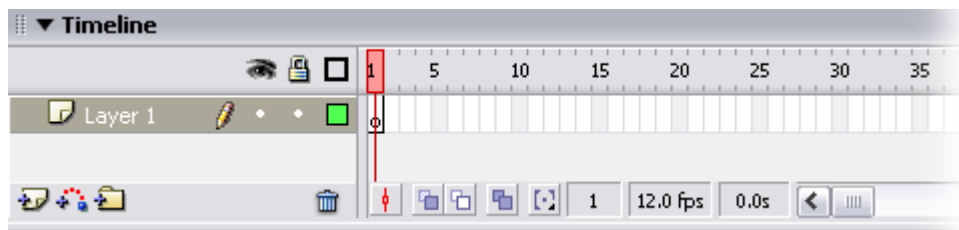
- To add a new layer, click on the **Insert Layer** icon  on the Timeline panel. This will insert a new layer directly above the layer that is currently selected.
- Be sure to make it a habit of naming your layers for better organization. Double click the layer name to change it.
- You may also easily rearrange the order of your layers by clicking a layer and then dragging it to the selected location among the rest of the layers.

- To delete a layer, select it by clicking on the layer name and then clicking on the trash can icon 

The Timeline

The Timeline is the essence of Flash. This is where your work comes alive in the form of animation. Although it may not be clear at first how the Timeline works, its use will become almost intuitive as you gain experience in working with Flash.

The Timeline represents all the frames in your movie. Like a cell-animated cartoon, the illusion of movement is attained by rapidly displaying the contents of a sequence of frames, just like a flip-book animation. Flash can handle several different types of animation – **frame-by-frame**, **motion tweening**, and **shape tweening**. All three animation techniques are conveyed by the Timeline.



The Timeline panel, including the layers section

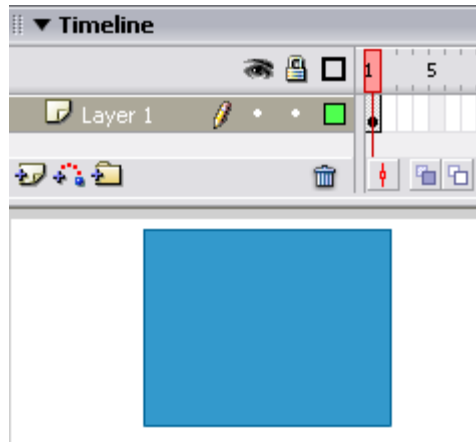
There are many details to the Timeline. Each block or tick mark represents a single frame. Frames are numbered in increments of 5 (by default) along the top. The number of frames in a Flash movie can vary depending on the length of the movie. You can use the scrollbar below the frames to see frames not currently displayed in the Timeline. Also notice that the numbers increase from left to right—this is the order in which your movie will play, at the designated frames per second (defined in the Document Properties dialog box).

The **Playhead** is the red rectangular marker located within the frame numbers. Its position designates which frame is currently displayed on the stage. To move the Playhead, click and drag it left and right to see how your movie behaves.

Frame-by-Frame Animation

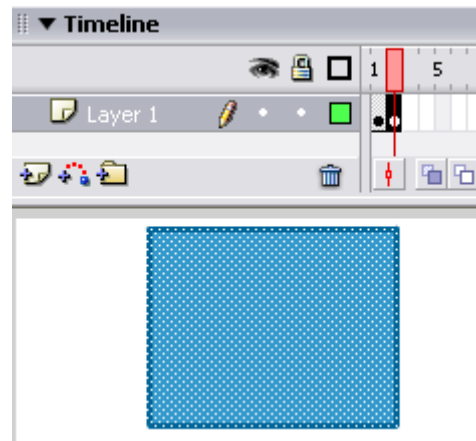
By learning frame-by-frame animation, you will have a better understanding of how the Timeline works and how you can control it.

1. First, create a shape in one layer on the stage, say, a rectangle. Notice the frame in the Timeline has a black dot after you have created the circle – i.e., it becomes a **keyframe**. Keyframes designate points in animation transitions and reflect changes in animation as the movie progresses.



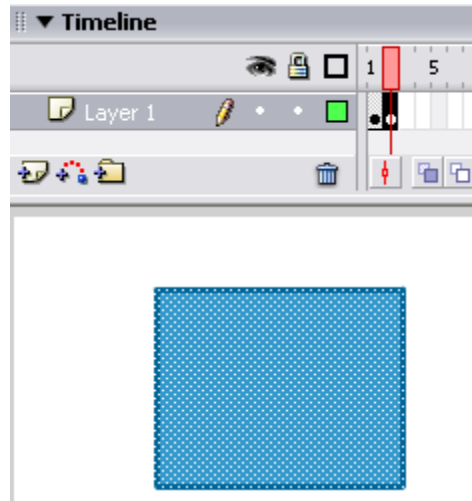
The first frame becomes a keyframe when you place an object on the stage

2. Now, click on frame 2 in the layer and go to **Insert > Keyframe**, or press the shortcut key, **F6**. Another keyframe will be created and your rectangle will be automatically placed on the stage in the second keyframe.
3. If the rectangle is not highlighted as a fine checkerboard pattern, use the Selection tool to draw a selection box around the rectangle.



A checkerboard pattern indicates the graphic object is selected

4. Now, hold down the **SHIFT** key and press the down arrow on the keyboard to move the rectangle down a few pixels. (Without the **SHIFT** key pressed, the rectangle will move one pixel at a time.)



The rectangle moves further down in the next keyframe

5. Click the next frame in the layer and insert another keyframe (**F6**).
6. Move the rectangle down again in the same manner.
7. Repeat this process until you have 12 keyframes, each with the rectangle moving down a little further than the last time. Now, if you slide, or “scrub”, the timeline playhead back and forth from the first to twelfth frame, you will notice that the rectangle “moves” up and down.
8. Move the playhead to the first frame and press **Enter** on the keyboard to play the movie. Congratulations, you have created your first Flash animation!
9. To preview your movie as it will play in real time, press **CTRL-Enter**. Watch how your animation plays and repeats. Close the movie to return to Flash.

Frame-by-frame animation is rarely used in Flash. Its use is mainly confined to animation sequences that require exact positioning and strict rates of change. Another circumstance to use frame-by-frame animation is to display imported movie file images, which is beyond the scope of this workshop.

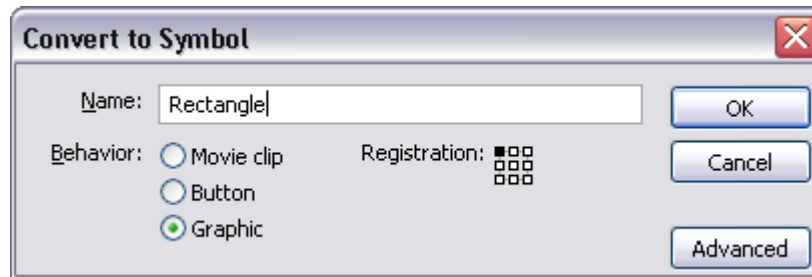
Motion Tween Animation with Symbols

You have just accomplished frame-by-frame animation in Flash, and as you may have noticed, it was rather tedious to move the circle down a little at a time in each frame to produce such a simple animation. We will now look at another type of Flash animation technique called motion tweening that will provide a shortcut for the same animation. To understand motion tweening, you will need to learn how to create symbols.

Symbols are objects that you create and store in a **Library**, allowing them to be reused in your movie in order to save computer system resources and make your project more manageable. For instance, if you wanted to create 10 circles, it would be much easier to define one circle and then clone, or copy, that circle 9 times than to draw all ten circles from scratch. If you changed your mind and wanted to use squares instead, you would only need to update your symbol once to change the rest of the circles to squares.

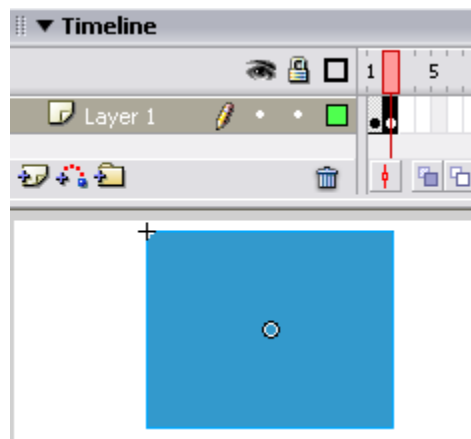
There are three kinds of symbols in Flash: **Movie Clip**, **Button**, and **Graphic**. For this introductory workshop, we will only focus on the Graphic and Button symbols. Let's create a symbol.

1. Create a new Flash movie by selecting **File > New** and choosing **Flash Document** under the **General** tab.
2. Create a rectangle on the stage of any color and size. Use the Selection tool to draw a selection box around the rectangle.
3. Go to **Modify > Convert to Symbol** or press the shortcut key **F8**. A popup dialog will be shown.



The Convert to Symbol dialog box

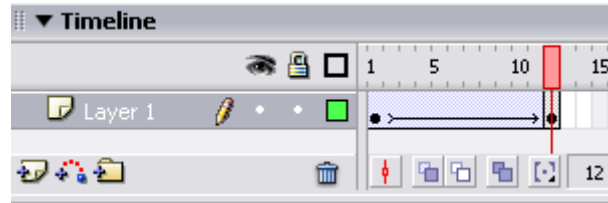
4. Name this symbol **Rectangle** and be sure to select the graphic subtype by clicking the **Graphic** radio button. Click **OK**. The checkerboard pattern on the rectangle disappears and a plus sign appears at the top left corner of the rectangle, indicating that it has successfully become a symbol.



A Rectangle symbol on the stage

5. Now, to animate it via motion tweening, click frame 12 (or whatever frame you want your animation to end on) in the timeline on the Rectangle layer and go to **Insert > Timeline > Keyframe** or press **F6**.
6. Use the Selection tool to select and drag the rectangle to a new position on the stage, noticeably far from its original position. You should have two keyframes in this animation: one at the beginning and one at the end of the layer with the rectangle on it.

7. Click on any frame between the first and last keyframes of the layer with the rectangle on it and choose **Motion** from the **Tween** menu on the Properties panel (or go to **Insert > Timeline > Create Motion Tween**) and you should see that Flash replaces all the grey frames between the first and last keyframes with a blue background and an arrow. This is the representation of a Motion Tween on the Timeline.

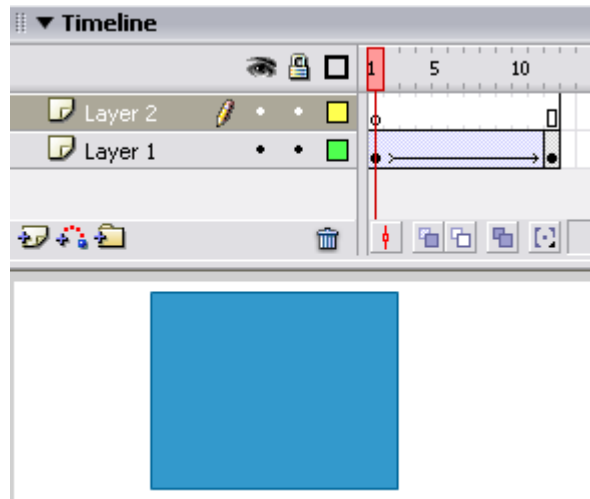


Motion tweening has been selected for these frames

8. Move the playhead to the beginning of your movie and press Enter. Your rectangle should move in increments from its starting position to its final position. This animation is essentially the same as your frame-by-frame animation but you did not have to fill in every step, just the first and last. Flash automatically interpolates the position of your symbol between keyframes. This is why it is important to designate keyframes – to specify beginning and end points of animations.
9. Now, let's make the rectangle move some more, this time in a direction perpendicular to the original direction. Click on frame 24 and create a keyframe (**F6**). Use the Selection tool to move the rectangle to a new location. Create motion tweening just as before and play your movie. By repeating this process, you can extend the length of your movie by creating more motion tweens between additional keyframes.

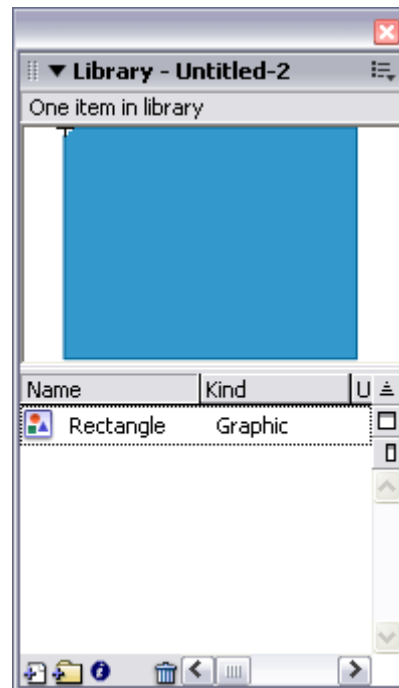
Remember that we created a Rectangle symbol when we made this animation. Now, let's add some more rectangles to our movie.

1. First create a new layer on top of the original one by clicking on the New Layer button at the bottom left of the Timeline. Creating a new layer is vital, since Flash does not allow motion tweens on layers with more than one symbol on the,



Adding a new layer to the Rectangle animation


2. Notice that Flash automatically creates blank frames that match the current length of your movie. We will create keyframes in place of some of these blank frames.
3. Click the first frame of this new layer and insert a new keyframe (**F6**).
4. Access the current Flash movie library by pressing **CTRL-L**.



The Library panel contains symbols you've created

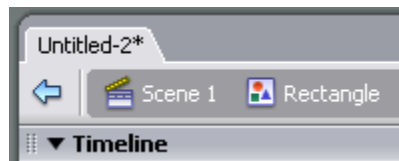
5. The library contains all of the symbols you have created for the movie and allows you to conveniently select any symbol and place it on the stage, thereby creating an **instance** of it. Make sure the playhead is on frame one of the Timeline and that the newly created layer is selected. Select the

Rectangle symbol from the library list and drag it to the stage. Position this new rectangle in an empty spot. Notice that Flash places a black dot in frame one of the new layer to indicate that it has become a keyframe.

6. This new rectangle, in effect, is a clone of your original rectangle – you did not have to recreate it. We refer to this rectangle as an **instance** of the Rectangle symbol. You can have multiple instances of the same symbol in your animation and you may alter the properties of each instance independently. Some properties you can change are tint, transparency, and size. We'll alter the tint property of this instance in the next step.
7. You can change the color of rectangle instance by first selecting it, choosing **Tint** from the **Color** menu on the Properties panel, and selecting a color from the color palette box . Your rectangle instance should now be a different color than the original Rectangle symbol.
8. You can also alter the instance by changing its size or shape with the Free Transform tool. Try different things to achieve different effects.
9. Once you have made all of your changes, animate the new rectangle in a similar fashion to the first rectangle, making sure that you create the keyframes in the proper layer. Notice how your top layer is “physically” on top – if this rectangle runs into your original rectangle, it will cover it.
10. Press **Enter** to preview the animation.

Editing Symbols

Editing a symbol that you have created will affect all instances of that symbol in your movie. For the above animation example, if you wanted your Rectangle symbol to be a circle instead, you will need to modify the original symbol. Open the Library panel (**CTRL-L**) and double-click the Rectangle symbol. The stage will fill the screen and your original rectangle drawing will be in the middle. Notice that the rectangle now has the appearance of a plain graphic (not a symbol) – i.e. has a checkerboard pattern when you select it. In addition, the upper left corner of the Flash document window will indicate that you are in symbol editing mode by showing your symbol name next to the scene number of your movie (Scene 1). Delete the rectangle drawing and replace it with a circle of similar size by using the appropriate drawing tools.




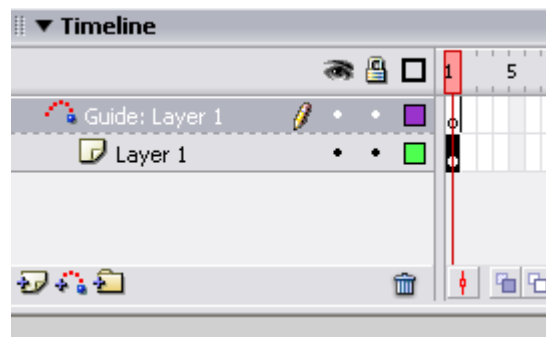
Symbol editing mode; click Scene 1 to return to the main movie

Click on Scene 1 in the upper left corner to return to your main movie. Notice that all rectangles that were cloned from the Rectangle symbol are now circles. You may rename your symbol to something more accurate (Circle) by right clicking on it in the Library panel and selecting **Rename**.

Motion Guide Animation

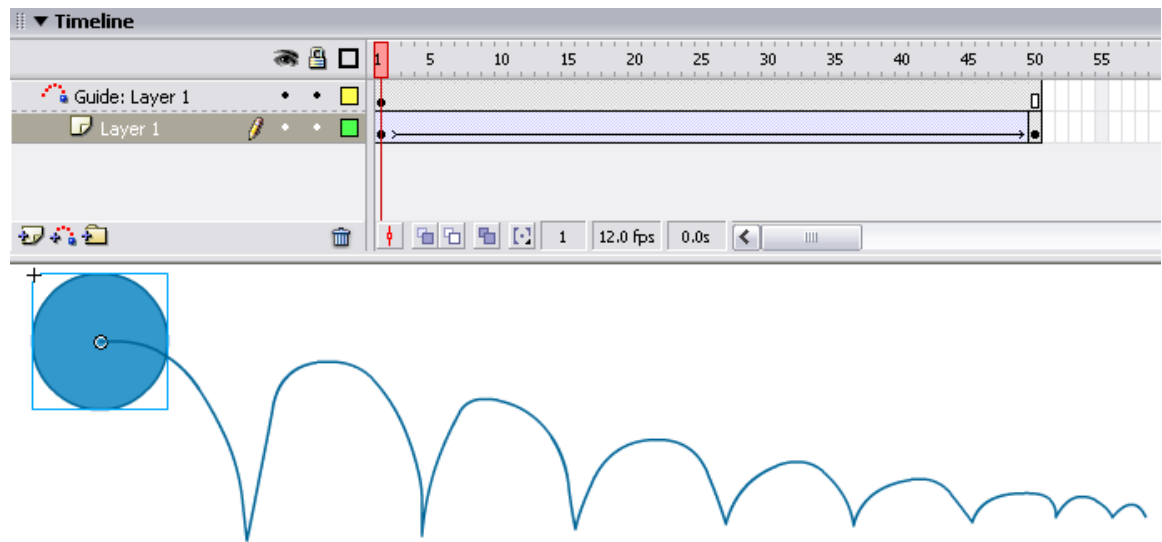
Notice that when you create a motion tween animation by following the above instructions, the graphic symbol moves in a straight line from keyframe to keyframe. Flash provides another method of motion tweening that involves using a motion guide. Essentially, a motion guide is a path for your graphic symbol to follow from the first keyframe to the last keyframe.

1. Create a new Flash movie by selecting **File > New** and choosing **Flash Document** under the **General** tab.
2. Draw a shape of any kind on the stage. Select it and turn it into a symbol (**F8**). Remember to make it a **Graphic** symbol.
3. Select the layer that contains your symbol, and click the **Add Motion Guide** icon . A new guide layer will be formed above your first layer, which is now indented to indicate that it is affected by the guide layer above it.



A guide layer that affects Layer 1

4. In the first frame of the motion guide layer (**not** the layer itself), use the **Pencil tool** to draw a path that you want your symbol to follow. Be sure your path is continuous – it should not have any breaks in it.
5. Now, insert a blank frame in the motion guide layer to indicate when you want your animation to end. You can do this by clicking on, say, frame 50 of the motion guide layer and going to **Insert > Timeline > Frame** or pressing **F5**. The motion guide layer is now set and you are ready to position the start and end point of your animation.
6. Click on the keyframe in frame one of Layer 1 (the layer with your symbol). Use the Selection tool to drag the center point, displayed as a circle, of your symbol to the start of your motion guide – your symbol should snap into place, and this confirms that it is the beginning point of your animation.
7. Insert a keyframe (**F6**) in Layer 1 at the end of your animation, in this case, frame 50. In this keyframe, use the Selection tool to position your symbol at the end of the motion guide. Again, align the center point of your symbol with the end of your motion guide path.
8. Finally, click on a frame between the two keyframes of Layer 1 and select **Motion** from the **Tween** menu on the Properties panel (or go to **Insert > Timeline > Create Motion Tween**). Your animation is now ready to play. Below is how your setup should look:



9. Press the **Enter** key to preview your animation. It should follow your motion guide perfectly.

 - The motion guide line is visible when you are working on a Flash animation. However, it will not appear in the actual movie. You can preview the actual movie by pressing **CTRL-Enter**.
 - One parameter that you can adjust for motion guide tweening is **Orient to Path**. If set, this means your symbol will rotate as it moves along the path, instead of always remaining in its original orientation. To turn this option on, click on the first keyframe of Layer 1 and select **Orient to Path** in the Properties panel.

Play your movie (**Enter** key or **CTRL-Enter**) to see how the animation is altered.

Frame Adjustments

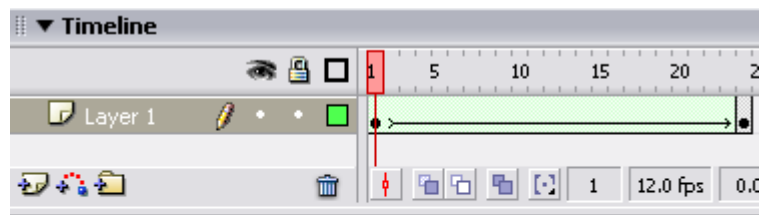
Now that you have created motion tweening and motion guide tweening, you may alter some properties in the way it progresses. Click on a beginning keyframe and look at the Properties panel. Particularly useful are the **Easing** and **Rotate** properties:

- Easing affects the acceleration of your symbol along its path. Set it to +100 to have it decelerate towards the end or set it to -100 to have it accelerate at the beginning.
- The Rotate parameter spins your symbol a specified number of times. Set it to different values and different directions to see what happens.

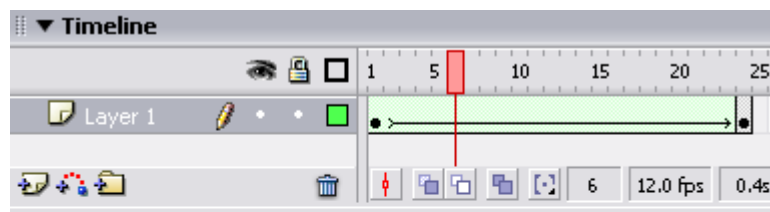
Shape Tween Animation

Shape tweening is another method you can use for creating animations. Another term for shape tweening that you may be familiar with is “morphing.” It is an animation technique that transforms one shape into another. Like motion tweening, shape tweening is accomplished by using a start and an end keyframe. Unlike motion tweening, however, shape tweening does not use symbols.

1. Create a new Flash movie by selecting **File > New** and choosing **Flash Document** under the **General** tab.
2. In the first frame of Layer 1, create a filled circle of any color on the stage.
3. Next, click into, say, frame 24 of Layer 1 and press **F6** to place a keyframe.
4. Notice that the contents of the first keyframe are copied into the second keyframe when you press **F6**. However, you want to transform your circle into a different shape, so press delete to remove the circle from the stage (make sure that the circle is first selected).
5. Create a rectangle on the stage.
6. Finally, click on any frame between the two keyframes and select **Shape** from the **Tween** menu on the Properties panel. Also, if your shape to be tweened has angles and straight lines, choose **Angular** from the **Blend** menu on the Properties panel. If not, choose **Distributive**. Once you do this, the frames between the key frames will become an arrow in front of a light green background. This is the representation of a Shape Tween on the Timeline.
7. Slide, or scrub, the playhead to the beginning of your movie and press the **Enter** key. Your movie should play and you should see the circle becoming a square.



First frame of shape tweening: circle



An intermediate frame in the shape tweening; becoming a square

Not only do shapes change, but colors may undergo a transformation too. Go to the keyframe in Frame 24 to highlight your shape and select a different color from the Fill

Color tool. Now play your movie again. You should see a smooth color and shape transition. As in motion tweening, you may adjust some frame parameters, such as easing, to alter movie playback.

Breaking Apart Symbols

Notice that when we create a shape tween, we do not need to convert graphic elements into symbols. Symbols cannot be shape tweened – they can only be motion tweened. If you have a symbol object that you wish to use in shape tweening, you must first “break it apart.” To do this:

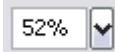
1. Select the symbol, and go to **Modify > Break Apart**, or press **CTRL-B**. Your symbol, instead of having a registration marker, will now be highlighted in a checkerboard pattern.
2. Now you may follow the steps as outlined above to achieve shape tweening.
3. To shape tween text, you will need to break apart the text in both keyframes. Experiment between using different shapes and different text to see which combinations and parameters produce the best and smoothest transitions.

More on Tweening

You are now familiar with three techniques of Flash animation: frame-by-frame, motion tweening, and shape tweening. Most animations you see on the Internet mainly use motion tweening, and you can achieve many dramatic effects using this simple technique.

Tweening is not limited to movement or morphing, however. We have already seen in the *Motion Tween Animation with Symbols* and *Shape Tween Animation* sections that we can include a color change in the tween as well as the motion or morphing. In the case of motion tweening, you can achieve effects such as a fade in or out, or making an object grow or shrink.

To achieve a fade in or out affect, you must change the Alpha property of the symbol in either or both of the beginning and ending keyframes. You can do this by clicking on the appropriate keyframe on the Timeline, selecting the symbol that is animated, selecting **Alpha** from the **Color** menu on the Properties panel, and adjusting the percent

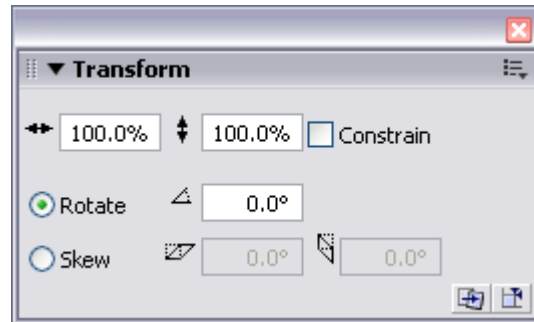
transparency with the slider . Set the alpha property of the symbol to 0% in the first frame and 100% in the last frame of a motion tween to achieve a fade-in effect. Reverse the values for a fade-out effect. Note that when an object’s alpha property drops below 100%, objects on lower layers may become visible through the semi-transparent object.

The other parameters that you can change in the Color menu on the Property panel relate to the symbol’s color and brightness levels. Altering these values will allow you to perform color transitions in your motion tweening animations.

In addition to altering color, tint, or transparency properties, you can alter the size and shape of a symbol in a motion tween using either the Transform panel or the Free Transform tool.

- To make a symbol seem as if it is getting larger or smaller, you can change the values for the width and height in the Transform panel. Click on a keyframe with

the symbol that you want to alter and change the scale of the object. If you want to scale evenly, you will need to check the **Constrain** checkbox. When you play back your animation, it will proceed to match the end keyframe symbol by growing larger or smaller, depending on how you first scaled it.



Changing geometric parameters in the Transform panel

- Other symbol properties that you may change are the skewing and rotation. Play with these values to see how your animation is altered.

Importing Graphics into Flash

Drawing in Flash takes time and practice to achieve the exact look that you want. However, if you already have a graphic that you want to use, Flash has the ability to import graphics of different types, namely JPEG, GIF, and BMP. These graphics are usually the ones that you encounter on a typical website, and can be edited in graphics programs such as Adobe Photoshop.

1. Create a new Flash movie by selecting **File > New** and choosing **Flash Document** under the **General** tab.
2. Create a keyframe (**F6**) in the first frame of the first layer.
3. Next, go to **File > Import to Stage**.
4. Choose the graphics file that you want to show up on the Flash stage and click **OK**.
5. The graphic will be placed in the middle of the stage and it is treated as a semi-Graphic symbol, meaning that you can create a motion tween animation right away without having to convert it into a Graphic symbol first.

Note: Even though you can create a motion tween right away, you may not alter its alpha blending (transparency) and perform other related actions to achieve the same fade-in effect as with true symbols. Therefore, it is best to convert imported graphics into Graphic symbols (by selecting it and pressing **F8**) right away, so that the full options will be made available.

Because you are manipulating bitmapped images that are not vectors, the file size of this Flash movie will usually be much higher than a vector-only based Flash animation. Keep this in mind when you are developing for a high traffic website, as you would want to keep the download sizes to a minimum.

Introduction to ActionScript

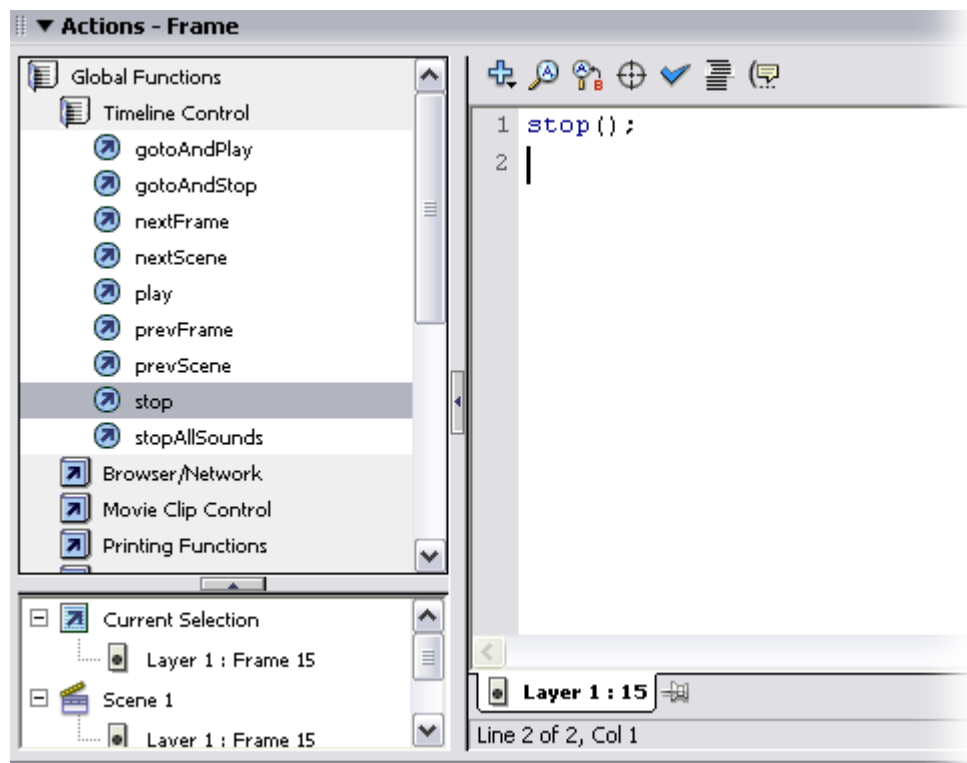
ActionScript adds interactivity to a Flash animation. ActionScript is a proprietary scripting language that controls the playback of a Flash animation, and can be very complex. In this documentation, we will discuss the fundamentals of ActionScript and look at a few important functions that are applicable to any Flash movie.

Snippets of ActionScript code, or simply actions, can be associated with a number of objects in a Flash animation. For example, you can associate actions with a particular frame of your animation. This will cause those actions to occur when the Flash player gets to that frame. You can also associate actions with events, such as when you click on a button, or when a movie clip is loaded into the Flash player. In this document, we will cover two ActionScript **functions**. Functions are built-in actions that are available for use in your Flash animation. The first function, **stop()**, will be associated with a frame. The second function **gotoAndPlay()** will be associated with an event, specifically, the clicking of a button.

Frame Actions: stop()

Notice that when you preview your Flash animation by pressing **CTRL-Enter**, it plays endlessly until you close the window. The movie repeats itself continuously because there is no command for it to end. To stop your movie after it has played, you will need to add the **stop()** function using ActionScript.

1. Click on the last frame of your Flash animation. Ensure that the Actions Panel is open (if it is not, go to **Window > Development Panels > Actions** or press **F9**).
2. Notice that the title bar of the Actions panel reads **Actions – Frame**. This indicates that you are creating actions that will be associated with a frame in the Timeline. The actions you add will execute when the playhead reaches that frame.



The Actions panel, with the function library (top left), movie explorer (bottom left), and script section (right) with the stop() function

3. In this case, we want the movie to stop here so we choose the **stop** action from the **Global Functions > Timeline Control** function library by double-clicking on it. The function is added to the script section on the right.
4. Hide the Actions panel by clicking on its title and in the frame that you have inserted the **stop** action, there will be a lowercase **a** to indicate that ActionScript has been added for that frame.
5. Now preview your movie (**CTRL-Enter**) and it should stop at the end.

Button Actions: Event Handlers

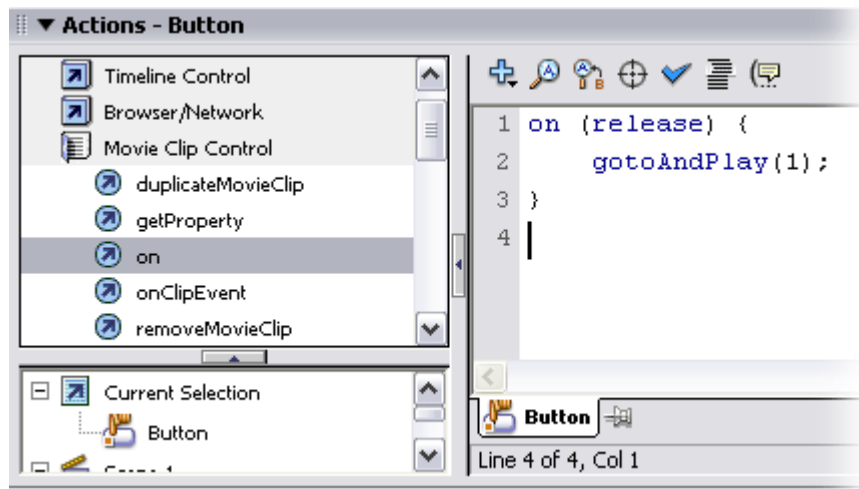
Buttons add a higher level of interactivity to your Flash animations. A Button is one of the three symbol types and has some unique properties associated with it. Here, we will use an action associated with a Button symbol to re-start a Flash animation.

1. Create a new Flash movie by selecting **File > New** and choosing **Flash Document** under the **General** tab.
2. To see how buttons can control the flow of your Flash animation, create a simple motion tween animation, say, of a circle moving horizontally across the stage. Make it span about 30 frames.
3. Add a **stop()** action in the final keyframe to make the movie stop at the end.
4. Now, create a new layer above the first one and create a rectangle shape on the stage that resembles a button. Place the shape so that it will be visible in the last keyframe of your animation.

5. Select this rectangular button and go to **Insert > Convert to Symbol**. This time, choose the **Button** type to make it have button properties.

Note: Buttons have special properties that respond to mouse actions. In addition, button behavior can be edited, although this is not necessary for proper functioning. To edit button behavior, such as changing colors when the mouse hovers over it, you will need to edit the button symbol by double-clicking on the button. Next, create keyframes under each button state and edit your button drawing accordingly.

6. The button symbol is ready to have actions associated with it. Open the Actions panel and click on the button symbol you just created. The title of the Actions panel should change to **Actions – Button**. This indicates we will be adding actions to our button symbol.
7. In order to associate an action with a button, we must specify when the action should execute, i.e. what **event** should trigger the action. For our purposes here, we want the action to execute when we release the mouse button on a click. Find and double-click the **Global Functions > Movie Clip Control > on** action in the function library to insert it into the script. Then choose **release** from the pop-up menu that appears in the code. The **on** action is known as an **event handler**. Whenever the event it handles occurs, the code included inside the event handler is executed.
8. Place your cursor right before the closing brace in your script. Next, find and double-click the **gotoAndPlay** action in the left pane to insert some more code. The right panel should then look like the one below. This completes our event handler. Now, when the viewer clicks and *releases* the mouse over the button, the movie will go to the first frame and begin playing.



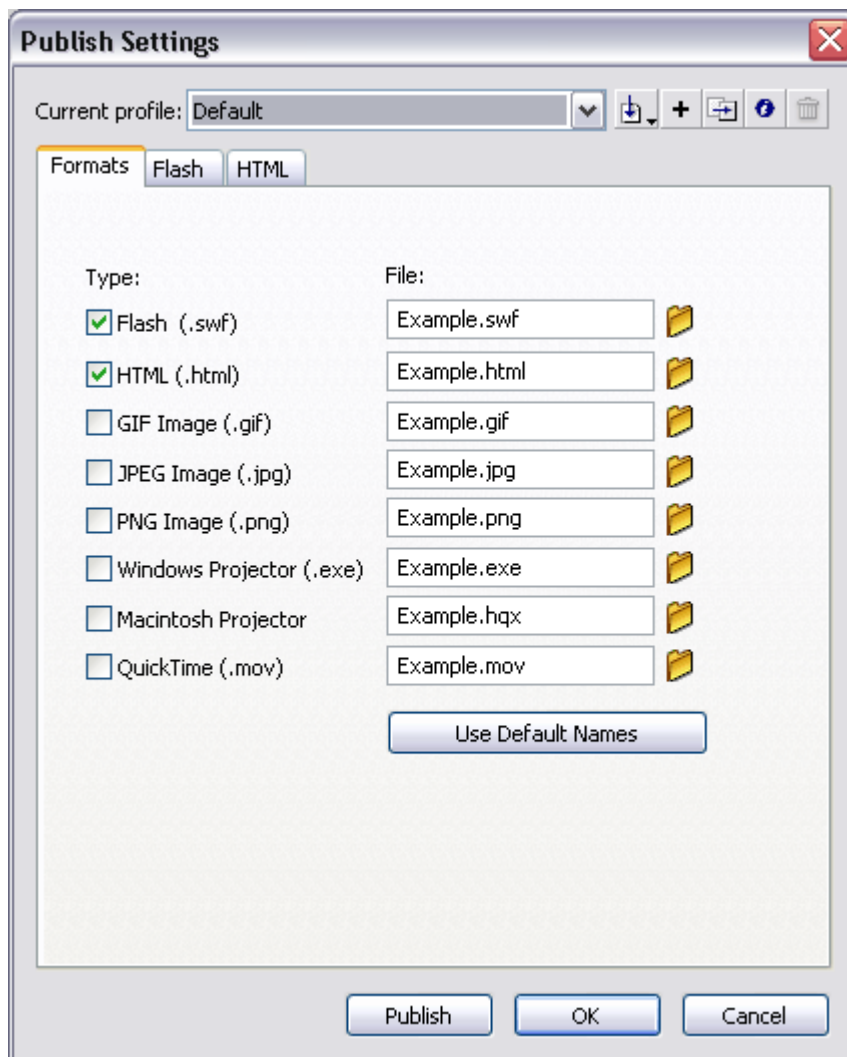
An event handler action for a button symbol

9. Hide the Actions panel.
10. Now preview your movie by pressing **CTRL-Enter**. Your movie should play to the end and stop, showing your button and waiting for user input. Click on your button and watch your movie restart at the beginning and play to the end again.

Publishing Flash Files to the Internet

Once you have created a Flash movie, you may want to publish it on the Internet so that others may see your work online. There are a couple steps for accomplishing this. In order to publish it to the web, you must embed your Flash animation in an HTML document. Flash has an automatic HTML generation function.

1. First, you will need to check the **Publish Settings**, which is accessed by going to **File > Publish Settings**.



Publish Settings window to create an HTML file with your Flash movie.

2. Make sure the HTML checkbox and the Flash checkbox are checked and fill in the file names you want to give to the documents. Click the yellow folder icons next to the HTML and Flash types to select the folder to which you want to save the files. Click **Publish**, and then click **OK**.
3. In your computer's file browser (e.g. Windows Explorer or Mac Finder), locate the files that Flash output. Double click the HTML file to see your movie play in a browser.

4. Finally, if you want to put your movie online, you will need to transfer this HTML file and the SWF file to a web server and have both of them located in the same directory.

For More Information

Here are some online sources of information about Flash:

<http://www.macromedia.com/software/flash/> -- Flash player plug-in download and news.

<http://www.flashkit.com> – Flash tutorials, sounds, samples, and message boards.

<http://www.flash411.com/> -- Online Flash tutorials and downloads.

Getting Additional Help

ACS provides consulting and Q&A help in a variety of ways:

785/864-0200

question@ku.edu

www.ku.edu/acs/help

Last Update: 07/07/2004