Frames and keyframes

Like films, Adobe Flash Professional CS5 documents divide lengths of time into frames. In the Timeline, you work with these frames to organize and control the content of your document. You place frames in the Timeline in the order you want the objects in the frames to appear in your finished content.

Frames define increments on the Timeline (**Figure 1**). The order in which frames appear on the Timeline determines the order in which they appear when a Flash document plays. You can arrange keyframes on the Timeline to edit the sequence of events in an animation.

A *keyframe* is a frame where a new symbol instance appears in the Timeline. A keyframe can also be a frame that includes ActionScript code to control some aspect of your document. You can also add a blank keyframe to the Timeline as a placeholder for symbols you plan to add later or to explicitly leave the frame blank.

A *property keyframe* is a frame in which you define a change to an object's properties for an animation. Flash can *tween*, or automatically fill in, the property values between the property keyframes in order to produce fluid animations. Because property keyframes let you produce animation without drawing each individual frame, they make creating animation easier. A series of frames containing tweened animation is called a motion tween.

A *tweened frame* is any frame that is part of a tween.

A *static frame* is any frame that is not part of a tween.

You arrange keyframes and property keyframes in the Timeline to control the sequence of events in your document and its animation.

A keyframe is indicated on the Timeline with a solid black circle. The frame where a keyframe span ends has a small white rectangle. A blank keyframe is indicated by an empty circle.

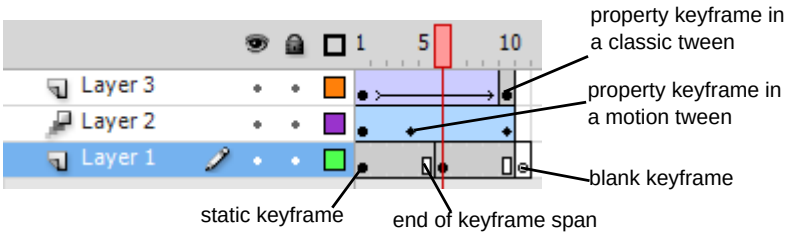

Figure 1 Frames

You can do the following with frames or keyframes:

- Insert frames, keyframes, and blank keyframes.
- Remove frames, keyframes, and blank keyframes.
- Convert frames to keyframes or blank keyframes.
- Drag frames and keyframes to a new location on the same layer or on a different layer.
- Copy and paste frames and keyframes.

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Representing animations in the Timeline

Flash distinguishes tweened animation from frame-by-frame animation in the Timeline by displaying different indicators in each frame that contains content. The following frame content indicators appear in the Timeline:

- A span of frames with a blue background indicates a motion tween. A black dot in the first frame of the span indicates that the tween span has a target object assigned to it. Black diamonds indicate the last frame and any other property keyframes. Property keyframes are frames that contain property changes explicitly defined by you. By default, Flash displays all types of property keyframes. All other frames in the span are *interpolated* by Flash depending on the properties changed in these keyframes. A ball that moves across the Stage, for example, might have an initial keyframe that positions it on the left of the Stage, and another keyframe that positions it on the right. All other positions of the ball—moving from left to right—are interpolated in the frames between the two keyframes .

- A hollow dot in the first frame indicates that the target object of the motion tween has been removed. The tween span still contains its property keyframes and can have a new target object applied to it.

- A span of frames with a green background indicates an inverse kinematics (IK) pose layer. Pose layers contain IK armatures and poses. Each pose appears in the Timeline as a black diamond. Flash interpolates the positions of the armature in the frames between poses.

- A black dot at the beginning keyframe, with a black arrow and blue background, indicates a classic tween.

- A dashed line indicates that the classic tween is broken or incomplete, such as when the final keyframe is missing.

- A black dot at the beginning keyframe with a black arrow and a light green background indicates a shape tween.

- A black dot indicates a single keyframe. Light gray frames after a single keyframe contain the same content with no changes. These frames have a vertical black line and a hollow rectangle at the last frame of the span.

- A small a indicates that the frame is assigned a frame action with the Actions panel.

- A red flag indicates that the frame contains a label.

- A green double slash indicates that the frame contains a comment.

- A gold anchor indicates that the frame is a named anchor.

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