

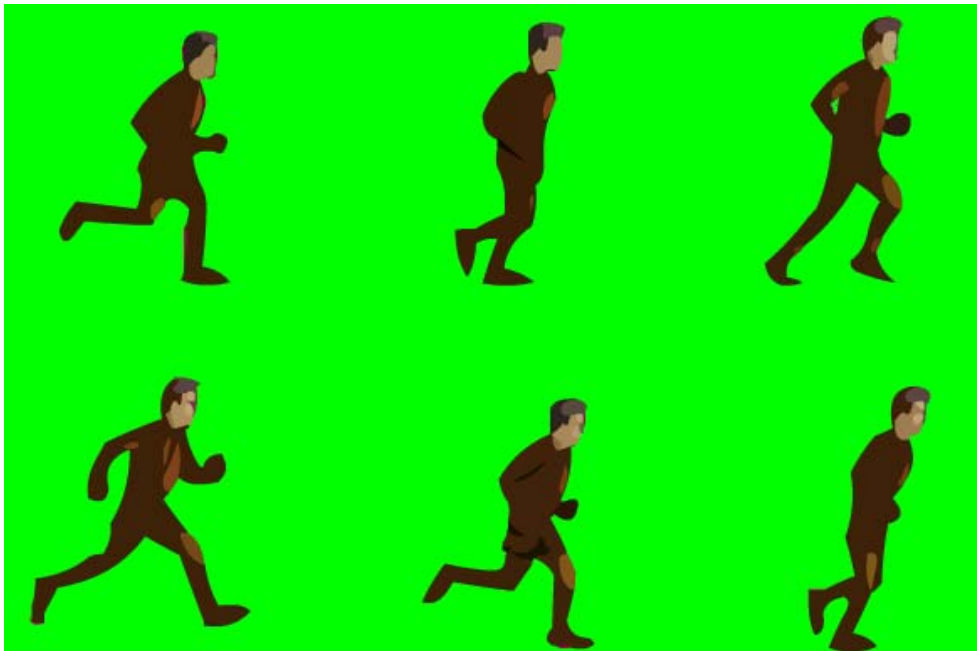
## How to use sprite sheets

In computer graphics, a *sprite* is a two-dimensional image or animation that is integrated into a larger scene. Sprites can be static objects, but are typically used for characters and other moving objects in video games. A running or jumping character is one example that appears in many adventure games.

### Creating and sharing sprites

You can create your own sprites by drawing original artwork in Flash or another graphic design program and then using the artwork to create and animate your game characters or other objects.

You can also use sprite artwork created by other graphic designers or sprite artists. People share sprites by creating *sprite sheets*. A sprite sheet is a depiction of various sprites arranged in one graphic image file (**Figure 1**). The collection of images includes the exact frames of animation for each character or object. Sprite sheets are also used to store tiles for tile-based games. To use the images in a sprite sheet, you can import the file into Flash and then add the images to a timeline to create your sprites.



**Figure 1** Sprite sheet

**Note:** You can also use ActionScript to import and display images in a sprite sheet. The ActionScript defines which sprite sheet to use and the exact coordinates of each image. The use of ActionScript to import sprite sheet images is beyond the scope of this guide.

If you've created your own sprites in Adobe Flash Professional, you can export a sprite sheet that includes the artwork in your Flash document library. Flash creates a single bitmap image file (PNG), including a grid of the artwork for your sprites. You can then share that sprite sheet with other animators and game developers.

### Using a sprite sheet to create animated characters

To create a new game sprite, you import all the necessary artwork for a character or object in a single sprite sheet. Sprite sheets are shared as bitmap files. After importing the bitmap image, use Trace Bitmap or Break Apart to isolate the artwork for each frame in the animation. You can then add the artwork to a new frame-by-frame animation, or use different versions of the artwork as keyframes in a Flash animation tween.

To import a sprite sheet:

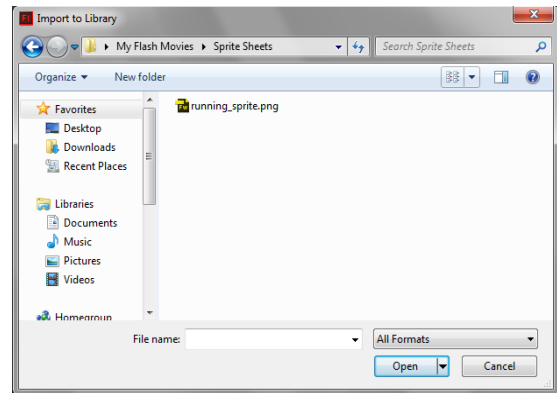
1. Start Flash and open a new blank document (ActionScript 3.0).

2. Select File > Import > Import To Library.

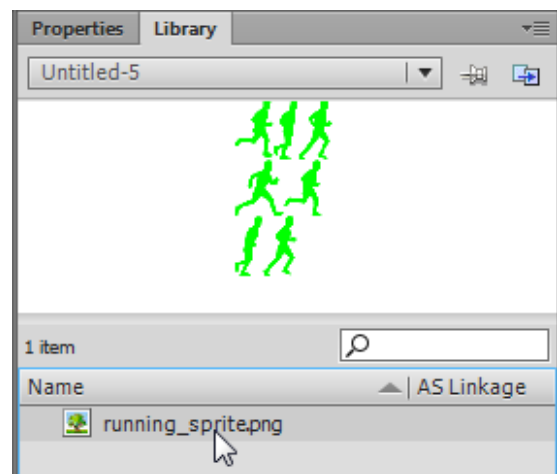
The Import To Library dialog box appears (**Figure 2**).

3. Select the sprite sheet file and click Open.

The sprite sheet graphics file is added to the Library panel (**Figure 3**). Most sprite sheets are created with a contrasting background color so you can trace and isolate the images in Flash.



**Figure 2** Import To Library dialog box



**Figure 3** Library panel

To isolate the artwork for each frame in the animation:

1. Drag a copy of the sprite sheet image file from the Library panel to the Stage (**Figure 4**).

2. Select Modify > Bitmap > Trace Bitmap.

The Trace Bitmap dialog box appears (**Figure 5**).

3. Make sure the Color threshold is set to 100 (the default value) and click OK.

Flash traces the bitmap and converts the image to a collection of shapes.

4. Click away from the shapes to deselect them.
5. Select the image that represents the first frame in your animation (**Figure 6**).

**Note:** Depending on the color and shape of the image, it may consist of a single shape or multiple shapes. You can marquee select or use the Lasso tools to select more complex images and groups of shapes.

6. Convert the selected shape to a graphic symbol. Give it a name that describes the character or object and its position in the animation sequence, such as `running_01`.

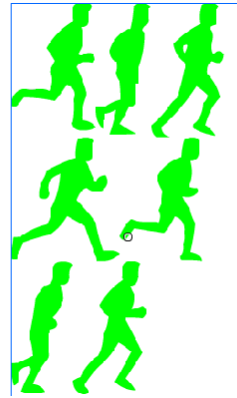
The new symbol appears in the Library panel (**Figure 7**). You can now use this symbol as a frame in a character animation to create your new sprite.

7. Convert the remaining shapes to graphic symbols and name them sequentially in the order they will appear in the animation.

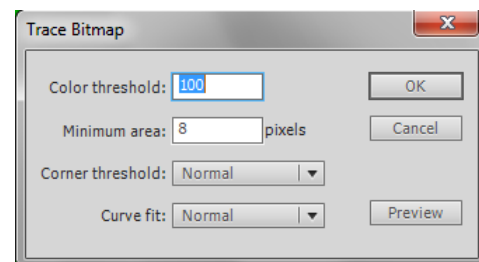
When have finished, you should have a series of sequentially named symbols in the Library panel.

8. Delete the symbol instances that are left on the Stage.

You will start with an empty Stage to create your sprite.



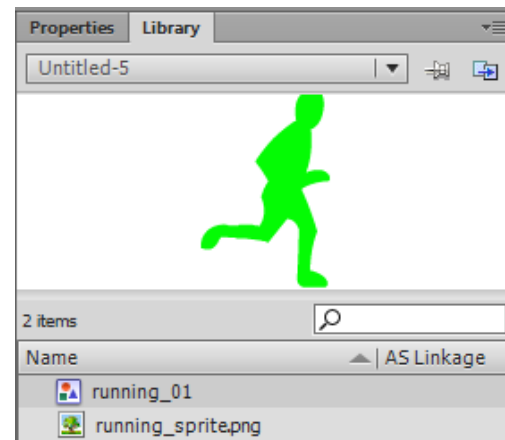
**Figure 4** Sprite sheet on the Stage



**Figure 5** Trace Bitmap dialog box



**Figure 6** Selected image



**Figure 7** New graphic symbol in the Library panel

To use the symbol sequence to create a sprite:

1. Select Insert > New Symbol.

The Create New Symbol dialog box appears (**Figure 8**).

2. Name the symbol, choose Movie Clip in the Type menu, and click OK.

The new movie clip symbol appears in the Library panel (**Figure 9**).

The timeline for the new movie clip symbol appears in the Timeline panel. It has one blank keyframe in Layer 1.

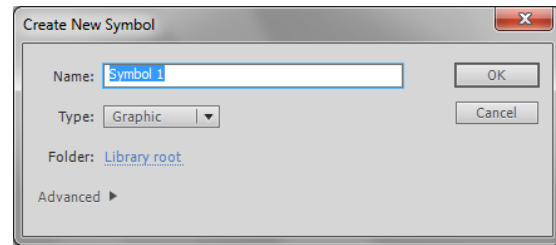
3. Drag the first symbol in the sequence, such as running\_01, from the Library panel to the center of the Stage.
4. Insert a keyframe in Frame 2 of Layer 1.

A new instance of the same symbol appears in Frame 2.

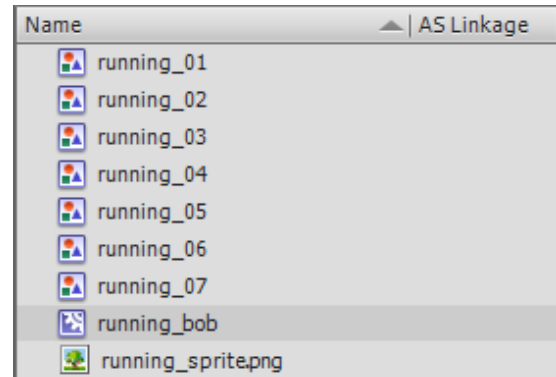
Instead of dragging each symbol to the Stage, you will add your keyframes first and then swap symbols to keep the symbols perfectly aligned from one frame to the next.

5. Add additional keyframes until the number of frames equals the total number of symbols in your sprite animation (**Figure 10**).

In this example, we inserted seven keyframes to hold the symbols representing seven positions of a man running. All of the keyframes contain instances of the same symbol, running\_01.



**Figure 8** Create New Symbol dialog box



**Figure 9** New movie clip in the Library panel



**Figure 10** One keyframe for each symbol

- Click Frame 2 in the timeline, click the symbol on the Stage, open the Properties panel, and click Swap (**Figure 11**).

The Swap Symbol dialog box appears (**Figure 12**).

- Select the second graphic symbol in the animation sequence, and click OK.

The symbol in Frame 2 is now the second symbol in the sequence.

- Swap the graphic symbols in the remaining frames so they contain the correct images at each step in the sequence.

Each frame should now contain a different image.

- Click the Play button at the bottom of the Timeline panel to play the animation sequence.

The sprite moves (in this example, the man runs), but the animation happens quickly because each image appears for only a single frame. You can slow the animation by adding frames.

- Click Frame 1 and press the F5 key a few times to add frames (**Figure 13**).

**Note:** You can also select Insert > Timeline > Frame to add a frame, but pressing F5 is faster when adding multiple frames. If you add too many frames, press Shift+F5 to remove frames.

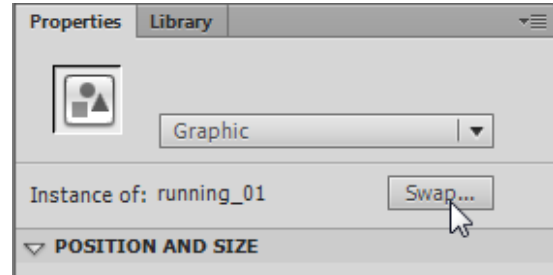
- Click each of the remaining keyframes in turn, and press F5 to extend the length of time you see each symbol in the animation (**Figure 14**).

- When you finish adjusting the timing of the animation, click Scene 1 above the Stage to close the movie clip symbol and return to the main timeline.

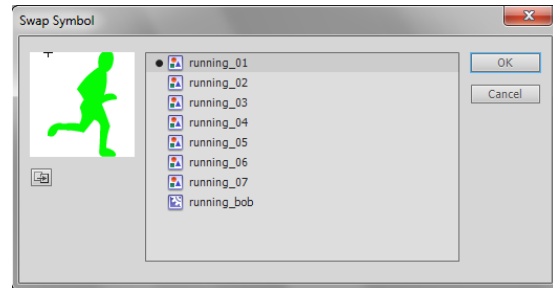
- Drag an instance of your new movie clip symbol from the Library panel to the empty Stage.

- Select Control > Test Movie > In Flash Professional to view the finished sprite.

- Close the preview window.



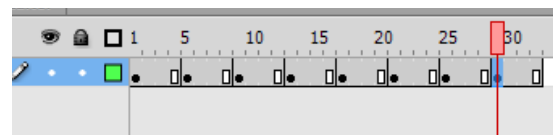
**Figure 11** Properties panel, Swap button



**Figure 12** Swap Symbol dialog box



**Figure 13** Added frames for the first symbol



**Figure 14** Added frames for the remaining symbols

## Generating sprite sheets from the Flash library

You've seen how to use a sprite sheet to make a simple character animation sprite. Now you export images to a new sprite sheet you can share with others.

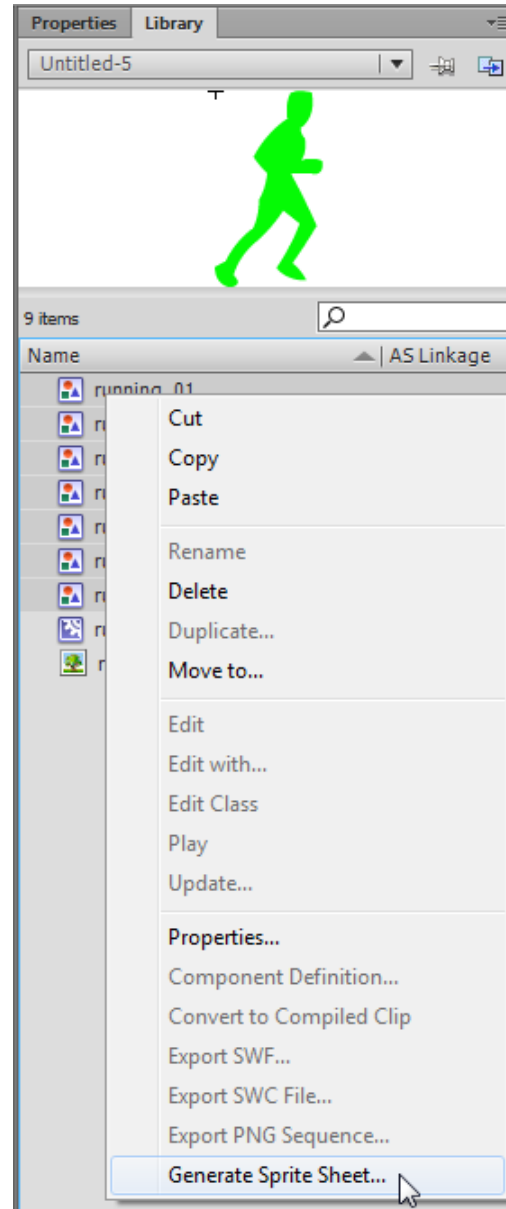
*To generate a sprite sheet:*

1. Open the Library panel and select the images to include in the sprite sheet.

You can hold down the Ctrl key (Windows) or Command key (Mac OS) to select noncontiguous images in the Library panel.

2. Right-click (Windows) or Control-click (Mac OS) anywhere in the selection, and choose Generate Sprite Sheet from the context menu (**Figure 15**).

The Generate Sprite Sheet dialog box appears.



**Figure 15** Library panel context menu

3. In the Generate Sprite Sheet dialog box, click Browse (Figure 16).

The Select Destination Folder dialog box appears.

4. Navigate to the folder where you want to save the sprite sheet. Enter a name for the file, and click Save.

You can select a new background for the sprite sheet. Selecting a background that contrasts with the images helps isolate the images for editing or cropping.

5. Click the Background Color swatch and pick a new color for the background in the sprite sheet (Figure 17).
6. Click Export.

Flash generates a single PNG file that includes the images you selected.

**Note:** You can also generate a sprite sheet from a movie clip symbol which includes animation. When you do, Flash generates a sprite sheet with a sequence of images from the movie clip.

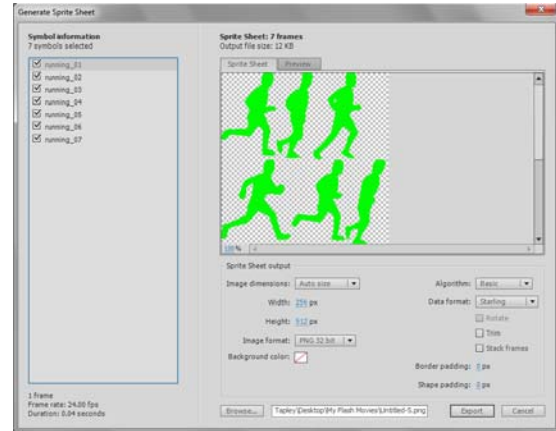


Figure 16 Generate Sprite Sheet dialog box

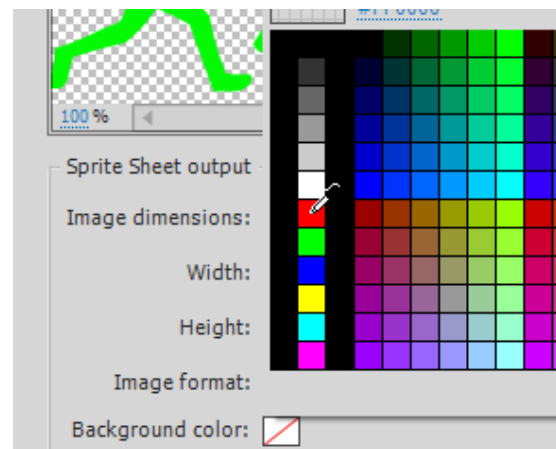


Figure 17 Background Color palette

## Exporting a bitmap (PNG) sequence

You've seen how to use a sequence of images to create a moving-character sprite. One way to create a sequence of images quickly is to export a bitmap sequence in Adobe Flash Professional.

*To export a bitmap sequence of images:*

1. Open the Library panel and right-click (Windows) or Control-click (Mac OS) the movie clip sequence that includes animation.

In this example, we used the movie clip of the running man created earlier in this guide. You can also select a movie clip with a motion or shape tween.

2. Select Export PNG Sequence from the context menu (Figure 18).

The Export PNG Sequence dialog box appears.

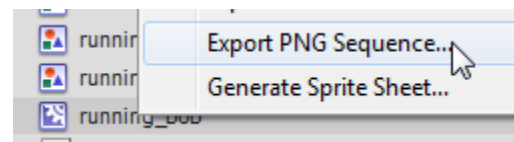


Figure 18 Library panel context menu

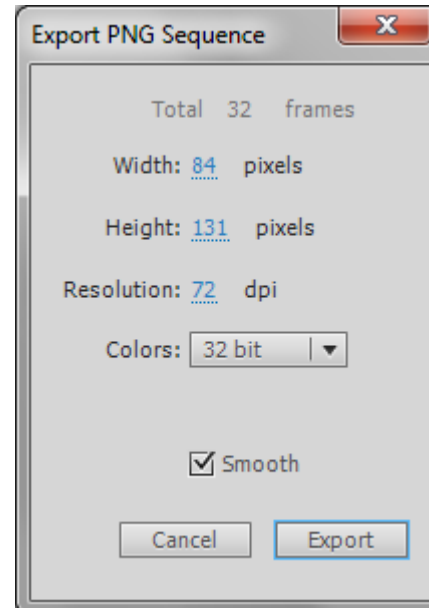
3. Navigate to a folder where you want to save the sequence of images. Name the sequence and click Save.

A second Export PNG Sequence dialog box appears with additional settings (**Figure 19**).

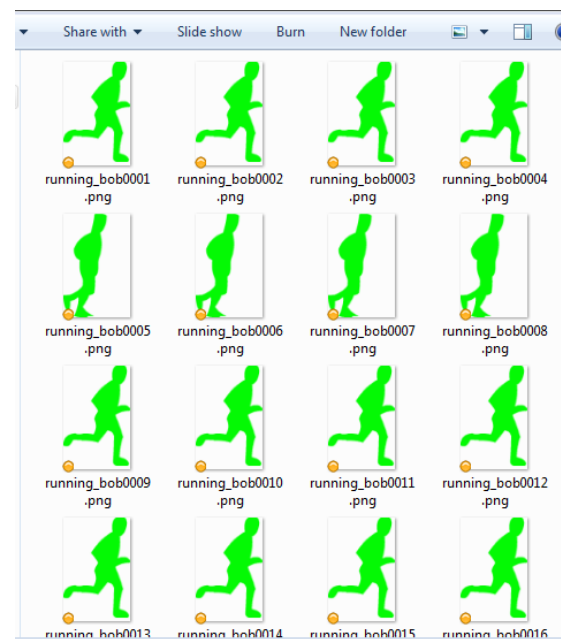
4. Click Export.
5. Open the folder you selected to store the sequence of images.

Flash created a separate file for each frame in the animation and named them sequentially (**Figure 20**).

You can share this file with others for importing into another Flash document and creating new sprites.



**Figure 19** Export PNG Sequence dialog box



**Figure 20** PNG sequence files