Concept
For efficient and performance-oriented character animation, Symbol Swapping offers many advantages as a Flash technique.
- Allows a fast change of visual information without the computational overhead of tweening, especially valuable when many things need to change all at the same time.
- Allows all assets to be downloaded before the beginning of the file playback which avoids lags during playback.
- Provides for a close approximation of traditional drawn animation results
- Allows for subdivision of characters and other objects into animated components rather than animating the whole.

A. Setting the Movie/Document Size and FPS (Do this first)
1. Use Modify > Movie or Modify > Document to set the size of your final stream file screen.
2. Use View > Zoom Out so you can see quite a bit of the grey margin around your screen.
3. Set the FPS (20 for the Symbol Swapping Exercise) and don’t change it again.

B. Creating the Symbols
1. Create a Series of Vector Drawings
The most direct method is to draw in Flash. After you’ve done this, you can go to Step 2.

If, instead, you are starting with bitmap images/drawings, then 2 different methods can work:
   a) Put the bitmap in layer and draw over it in either Flash or Illustrator. This method offers more control over the number of control points in shapes and lines. This is the preferred method.
   b) Import bitmaps into Flash and use Modify > Trace Bitmap to convert components such as eyes, mouths, hair, hands, body parts, into vector objects.
   If necessary, use Photoshop to separate out facial features and body parts to be vectorized in Flash. This method doesn’t offer as much control as a). See the Trace Bitmap Information Sheet for details on this process and its options.

   2. Set up Drawings to be Animated in Flash
Start with the first vector drawing. Place that in one layer and then add a layer on top of it and draw a variation on that in the same frame. Turn on Onion Skinning so you can see your reference underneath. You don’t need a lot of drawings. A blinking eye would take 2 or 3 maximum different drawings.

   3. Line up the Registration Points of the Drawings
Place each drawing on a separate layer in the same frame and use Onion Skinning to line up their registration points (VITAL!) and draw any subsequent variations needed. Then, you can shove each drawing over so that
drawing 1 is on frame one, drawing 2 is on frame two, etc. Then use the Red Timeline control to “flip” the drawings and test your animation.

4. Convert to Graphic Symbols, Name, and Organize in Library
When these vector drawings are ready, select each one in turn and Modify>Convert to Symbol (choose “graphic” symbol). MAKE SURE YOU DEVISE A COHERENT NAMING CONVENTION FOR THESE SYMBOLS, e.g. mouth_1, mouth_2, eye_cl, eye_op, eye_lft, eye_rgt, etc. You can also group these symbols in the Library by creating a folder using the Library drop-down menu and dragging the symbols onto it.

5. Clean Up
After you have the symbols for a given component set up and in the Library, you can delete them from the scene layers and go onto the next group. Or you can develop all of the sets simultaneously but located on different frames.

The Process – Animating Symbols in the Timeline
1. On the first frame of your SCENE, name the first/top layer “Load-Stash” and place all your symbols on the grey margin area around the white screen. This will cause all the symbols to be downloaded at the beginning which avoids lags during playback.

Note: Where you place the drawings for animation – in the scene, in a graphics symbol, or movieclip symbol - depends on how you want to play the animation. See Tips for Success, below.

2. Create a new layer for each drawing graphic symbol set, e.g. one for Eye-R, one for Eye-L, one for Mouth, etc., and name it.

3. Select the first frame in a layer and drag the appropriate graphic symbol in the set to its location on the screen. Then use Alt/Option+Drag to copy that symbol across a range of frames.

4. Set the time marker on a frame where the symbol should change to the next one in the set and click on the Swap Symbol button on the Instance Property Panel (MX) and select the next symbol from the list in the library. This places the new symbol at the exact location as the original one, preserving registration.

6. Repeat steps 4 and 5 until you have the entire animated component in the layer.

7. Now, tune the timing by dragging the leading keyframe (black dot) and the trailing keyframe (white box) of each symbol span. Aim for lively, lifelike timing. Sometimes a symbol will only be seen for a frame or two.

8. The above steps have taken place in the Scene timeline. You can also do this in a MovieClip timeline or Copy Frames/Paste Frames from the Scene into a MovieClip.

Tips for Success
0. Do NOT use multiple scenes for the Character Cameo or any other project. Use Movieclip symbols to
compartmentalize your work.

1. For looping actions that repeat endlessly, independent timing, or independent play/stop control, you can do all of the above in a Movieclip Symbol timeline then drag that symbol to the scene timeline. You can also include a button in the Movieclip that plays the Movieclip. This enables you to have self-contained components of the work to develop and debug separately.

2. Aim for short, compartmentalized actions that start and end with the same symbol. That will allow you to modularize the character’s actions.

3. Plan how to sequence your layers in the scene and in Movieclip symbols. For instance, for a facial close-up, you might want to have the eye-pupil be separate from the eye-lids so the eye can look left and right or you might want to create left and right looking versions of the eye-open symbol.

4. Hand drawn character animation is very detailed work, so plan and develop short pieces of business and then build from there.

5. Start out with a simple plan.