

**FLASH CS4:
GET A TASTE OF ACTIONSCRIPT 3.0 HANDS ON!**

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GET A TASTE OF ACTIONSCRIPT 3.0 HANDS ON!

Module 1: Overview of Flash ActionScript

This module will explain what ActionScript 3.0 is, what it does and the benefit of using it to add functionality to your eLearning projects.

Module 2: Button Controls

During this module, we will be creating a very simple movie. You will utilize buttons and ActionScript to create simple navigation.

Module 3: Frame Navigation

Now that you can navigate, this module shows you how to create a simple frame counter that displays the total number of frames in the project, and what frame the user is at in the project.

About the Author

Thomas Toth, based in the Denver, Colorado area, is a Certified Developer with over a decade of training, management and design experience in the computer and technical education industries. Thomas has designed and programmed several hundred web sites and on-line training courses using Adobe software products for national and international corporate clients. He is the President of dWeb Studios, Inc., a web and eLearning design and development firm in Parker, Colorado.

In his professional life Thomas wears the hat of Web Master, Instructional Designer, Leadership Consultant, Project Manager, HTML Programmer, Graphic Designer, Flash Programmer, Executive Coach and Stand-Up Trainer. Thomas teaches Dreamweaver, Fireworks, Flash, Photoshop, and InDesign at local area training centers, bringing his students real-world knowledge and experience on how to use these products.

Thomas is the author of the book Technology for Trainers, published by ASTD in April 2003. Technology for Trainers is an eLearning primer, written for the Learning and Development professional who is faced with the task of developing eLearning for their organization. He is also a contributing author to the ASTD Handbook for Workplace Learning Professionals, published in 2007.

Thomas has his B.A. in Human Communication, his M.A. Ed with a focus on Educational Technology, and belongs to several professional organizations such as ASTD, the American Marketing Association, eLearning Guild, Toastmasters and the HTML Writers Guild. Thomas is also a published and performing magician, a trained chef and musician.

Module 1: Overview of Flash ActionScript

When Flash first appeared on the scene, it did an amazing job of creating animated objects in the browser. Moving objects, fading text and simple animation amazed and fascinated the web audience who were once content with just animated GIFs. With Flash, it was possible to create many simple, yet engaging, animations.

As Flash grew up, users wanted to do more things with their Flash movies. Developers were not content with the simple programming tools and demanded a more robust programming language. When Flash 5 was released, ActionScript 1.0 was born. “Actions” was replaced by ActionScript, and a whole new level of interactivity became available to the Flash programmer.

With the release of Flash MX 2004, ActionScript grew up and became ActionScript 2.0. From 2003 - 2006, users received a whole new slew of functions and capabilities. ActionScript was close to becoming a fully functional scripting/programming language! It was a very exciting time, because programmers could create true user interactivity from within their Flash projects.

In June of 2006, ActionScript 2.0 was replaced with ActionScript 3.0 in the Flash CS3. ActionScript 3.0 is a completely different language. Following the playbook for JavaScript, ActionScript 3.0 is a complete re-write. Users who mastered AS 2.0 were quick to realize that they had to un-do most of what they already knew. Common behaviors and programming strategies went out the window as programmers had to re-learn many of the most common ActionScript behaviors and functions.

This puts **YOU** into an amazing position. If you are not a master of AS 2.0, you can pick up AS 3.0 pretty quickly. You won't have to “unlearn” anything. If you have spent lots of time mastering AS 2.0, that's OK too! You can take what you already know about Flash's power and interactivity and apply it using the new language.

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Why Use ActionScript

Quite simply, ActionScript makes you movies come alive! For the eLearning developer, Flash is a powerful tool for the delivery of online learning. Complex simulations or animations that used to take weeks and months to create can now be completed in a very short time. Not only that, but the simulations can be created as interactive elements that enabled users to effect and change the animation.

If you are a Flash developer who creates eLearning projects, the knowledge of how to create simple, linear animations is no longer enough. Interactive elements are key to a successful eLearning project, and these interactive elements are programmed into Flash by using its native language: ActionScript.

Buttons, page turns, drag and drops and other sorts of interactivity, including database and XML connectivity, can be programmed into Flash movies using ActionScript.

Who's Afraid to Code?

Does working in code scare you? That's OK...it scares me too! As designers, we are used to creating pretty interfaces, graphic design work and thinking about the user experience. The "under the hood" programming can be very intimidating to people who don't do it on a regular basis. However, if you want to create amazing online learning projects, you need to know some of the basics in order to really take your projects to the next level.

I have one regret about ActionScript in Flash : I wish I had started programming in ActionScript sooner than I did. I was afraid of it and only knew the bare bones - simple Stop or Play commands that allowed me to "fake it" for many years. When I finally bit the bullet and learned to program ActionScript, it took a long time for me to get comfortable with it. I wish I had started earlier.

Congratulations to you for being here and stretching into this world of programming! I promise to make it fun and interesting!

Actions Panel

The Actions panel is where you will be typing your code into Flash. All of the code you attach to the timeline will be entered into this area. In ActionScript 3.0, you cannot add ActionScript directly onto buttons or movie clips, everything is coded directly into a key frame on the timeline.

1. Actions Toolbox

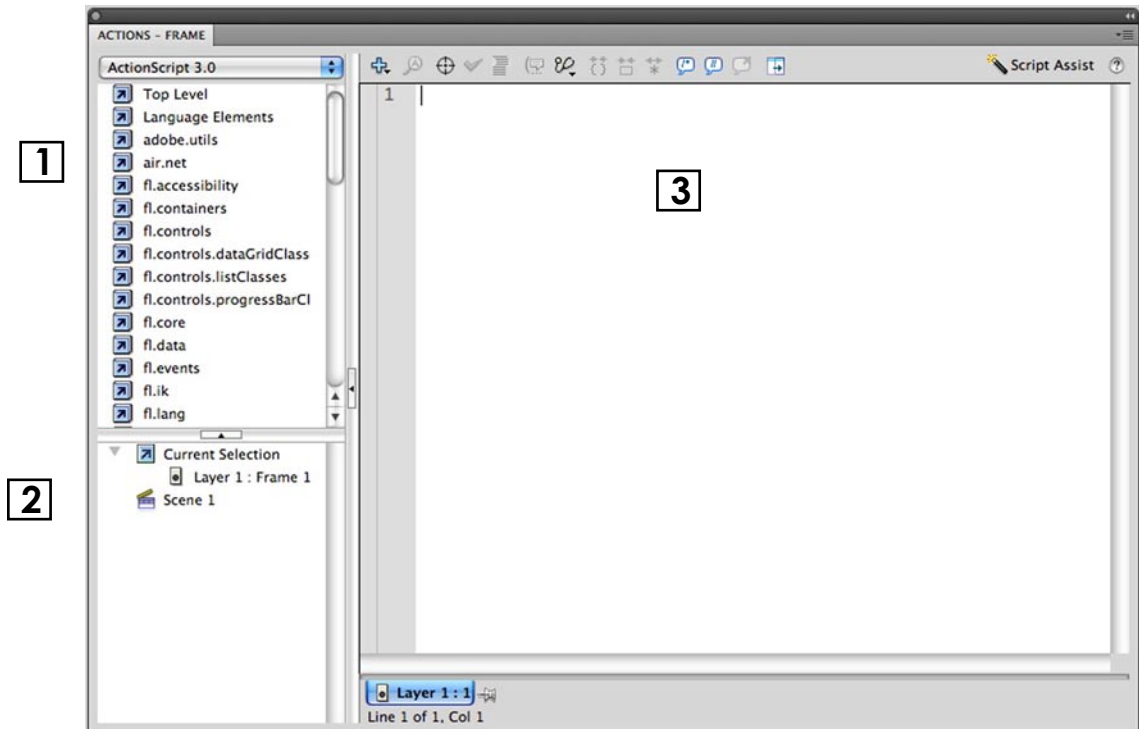
The Actions Toolbox provides a list of all the ActionScript functionality in Flash. Clicking on one of the arrowed “books” opens that folder to reveal more books or samples of code. Double clicking on the circle next to the code inserts that code into the Script Pane.

2. Script Navigator

The Script Navigator shows you which frames have scripts, and allows you to quickly jump to the code. ActionScript is notoriously hard to edit and update if you are not the primary coder. The Script Navigator helps tremendously.

3. Script Pane

The Script Pane is where you will be typing your code.



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House Rules

During this session, I don't expect you to know what every panel or tool can accomplish. I don't expect you to be able to understand the back story or the "whys" of the code. My goal is to give you a test drive of ActionScript 3.0 and introduce you to some of the features an eLearning developer needs to be successful. I will hand hold you through most of it, so don't worry.

Don't be discouraged if you cannot find a tool or panel set right away. Watch my screen or ask your neighbor for assistance. This isn't rocket science. No one is going to lose their life because you cannot immediately find the Text tool. What I am saying to you is to **have fun with this program!** Flash is very cool!

Now...Onto the Programming!!

Module 2: Button Controls

You are going to be creating a movie that demonstrates some of the basic ActionScript functions in Flash. During this module, we are going to build a simple menu of buttons and then add some ActionScript to make the buttons jump the user around the timeline.

Before you begin any project, you have to have a good idea of what you want to see happen; almost like a story board. For our example, this is the sample “pseudo-code”:

1. Four buttons on the navigation take the user to different locations on the timeline.
2. The “Home” button takes the user to the Home frame.
3. The “Module 1” button takes the user to the Module 1 frame.
4. The “Module 2” button takes the user to the Module 2 frame.
5. The “Test” button takes the user to the Test frame.

The first thing we are going to do is prepare the stage for our objects. We are going to add **frame layers** to house our individual elements. For our movie, we are going to need four layers.

When we are done with this section, your layers will be stacked like this:

Actions
Labels
Navigation
Menu

Let’s create a new ActionScript 3.0 movie and get started.

1. Open Flash CS4.
2. From the main red section, choose Flash File (ActionScript 3.0) from the center section titled Create New.

This will open a new Flash file using the AS 3.0 virtual machine.

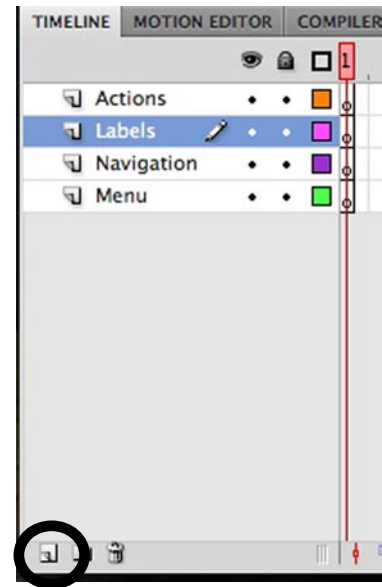
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Action 1: Adding Your Layers

When you first opened your Flash movie, you had just one layer called Layer 1. We are going to give your movie three more layers.

To Add A Layer:

1. On the layer panel, toward the bottom of the stack, click on the left icon. This is the add layer icon.
2. A new layer titled Layer 2 will now display above Layer 1.
3. Click two more times until you have four layers.



Action 2: Changing the Titles of Your Layers

Layer 1 is not a good description of what is contained on your layer. After all, you may be creating movies that contain 25 or more layers. You need a way to understand what is contained on that layer. Flash allows you to assign a name to each layer in order to make them easier for you to know what is happening on each layer.

To Change the Title of Your Layer:

1. Double click on the current layer title.
2. It will change to a text box and allow you to type in a new name. Press [Enter] when done.
3. Change the names of your layers to Actions, Labels, Navigation and Menu, top to bottom. (Refer to the image at the top of this page).

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Actions on Top

A best practice to do is to keep all your ActionScript in your top most layer and name that layer “Actions” or “Scripts”. By default, when you compile the Flash movie, it is set as “bottom-up” for the load order. This means that the lower-most layer is loaded first and then proceeds up to the top of the stack. By having your ActionScript at the top, you can be assured that all your assets will have loaded before your scripts try to access them.

Also, having all your scripts on a single layer makes it easier to find your scripts when it is time to edit!

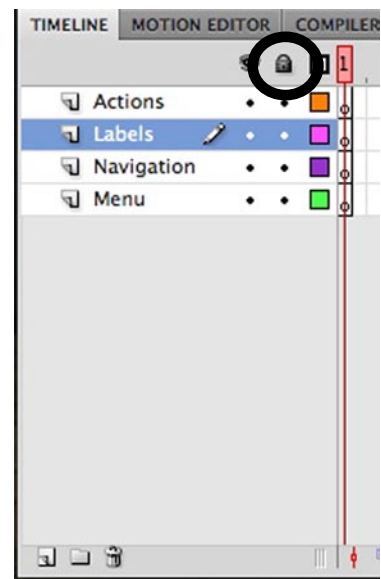
Action 3: Saving the File

Now would be a good time to save the Flash movie. Click on File -> Save. Choose a name and location for your file and click [Save]. Save it to the desktop using your first name as the filename.

This version of Flash is the most stable, but I’d hate for you to have to start over!

Action 4: Locking Layers

1. Click on the lock icon at the top of the layer stack. This will lock down all the layers in our movie. Doing so makes sure that we are adding content to the right layer.
2. Unlock the Menu layer by clicking on the lock icon on that Layer. (Not the one at the top of the stack). This will unlock the Menu layer, allowing us to add content.

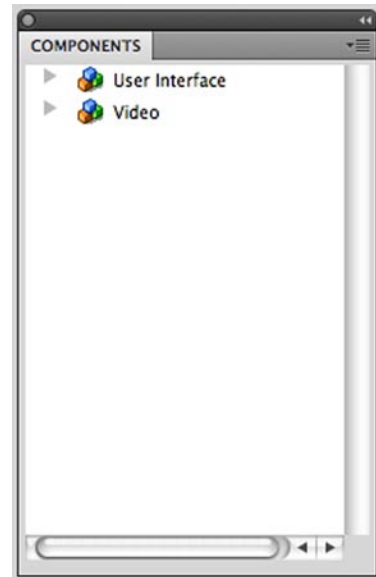


Action 5: Adding Buttons

1. Click on the first frame on the Title layer.
2. Open the Components Panel. Choose Window -> Components.

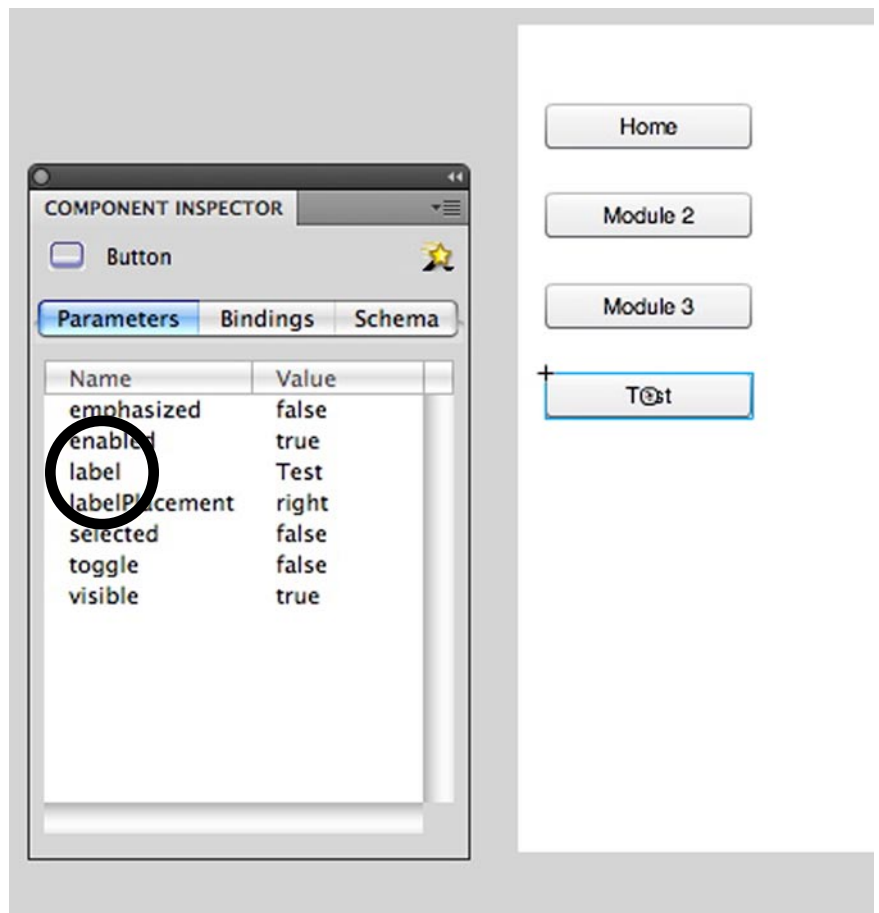
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- The Components Panel will display. In ActionScript 3.0, you only have a few component categories to choose from.
- Click on the gray triangle to expand the User Interface options.
- Find the Button object. Click and drag one to the stage. Be sure to add them to the Menu layer.
- Drag three more Button objects to the stage. Align them and position them where you'd like.
- Once you have the buttons where you'd like them, open the Component Inspector. Click on Window -> Component Inspector.



- Click on the top button.
- The Component Inspector will change, allowing you to change the text label that appears on your button.

- With the top button selected, click into the label field and change its value to "Home".



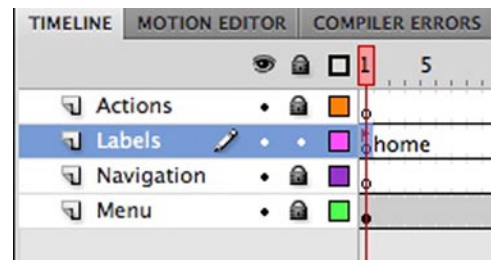
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11. Click on the second button. In the Component Inspector, click into the label field and change its value to Module 2.
12. Click on the third button. In the Component Inspector, click into the label field and change its value to Test.
13. Lock this layer. You have created your simple navigation.
14. Save your file.

Action 6: Adding Frames and Labels

1. Using the scroll bar beneath the timeline, scroll to the right until you see frame 40 displayed.
2. Click into frame 40 of the Actions (top) layer.
3. Hold down the [Shift] key and click into frame 40 of the Menu (bottom) layer.
4. You will now have a black bar filling frame 40 on all four layers. Press [F5].
5. By pressing [F5], you have added the necessary frames to your movie.
6. Unlock the Labels layer. Click on frame 1 of the Labels layer.
7. In the Properties Inspector (on the right), locate the Label section of the panel. In the Name field, type:

home
8. You will notice that the key frame in frame 1 of the Timeline displays “home”.
9. Click on the Text Tool, and then onto the top section of the stage. Type “Welcome to my eLearning project.” Click on the Selection (Black Arrow) tool.



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10. Click into frame 10 of the Labels layer.
11. Right mouse click and choose Insert Keyframe.
12. In the Properties Inspector, in the Labels panel, type
`module1`
into the Name field.
13. Click on the text tool.
14. Click into the text box and change the text to read Module 1. Click on the Selection (Black Arrow) tool.
15. Click into frame 20 of the Labels layer.
16. Right mouse click and choose Insert Keyframe.
17. In the Properties Inspector, in the Labels panel, type
`module2`
into the Name field.
18. Click on the text tool.
19. Click into the text box and change the text to read Module 2. Click on the Selection (Black Arrow) tool.
20. Click into frame 20 of the Labels layer.
21. Right mouse click and choose Insert Keyframe.
22. In the Properties Inspector, in the Labels panel, type
`test`
into the Name field.
23. Click on the text tool.
19. Click into the text box and change the text to read Test. Click on the Selection (Black Arrow) tool.

Action 7: Naming Buttons

1. Each button needs to have a unique name so that when we add ActionScript to the project, the code knows how to process the interaction.
2. Lock the Labels layer.
3. Unlock the Menu layer.
4. Click on the top button (Home).
5. In the Properties Inspector, change the Instance Name to:
`but_home`
6. Click on the second button.
7. In the Properties Inspector, change the Instance Name to:
`but_module1`
8. Click on the third button.
9. In the Properties Inspector, change the Instance Name to:
`but_module2`
10. Click on the bottom button.
11. In the Properties Inspector, change the Instance Name to:
`but_test`
12. Note that there are no spaces allowed in ActionScript 3.0. If you want a space, use `_` or change capitalization techniques like:
`butTest`

Action 8: Write ActionScript to Control the Buttons

1. Each button needs to have a unique name so that when we add ActionScript to the project, the code knows how to process the interaction.
2. Lock the Menu layer.
3. Unlock the Actions layer.
4. Click on frame 1 of the Actions layer.

We need to add a listener to each of our buttons in order to “do something” when it is clicked. Listeners are a basic means for handling events in object-oriented languages. A listener is an object that is notified when an event occurs.

To create a listener, the object on which an event will occur (such as an instance of a Button in our project) needs to be notified about which object will respond to its events. This is known as adding a listener to an object.

5. Open the Actions Panel. Press [F9] or choose Window -> Actions.
6. In the Script Pane, type:

```
but_home.addEventListener(MouseEvent.CLICK, onHome);
```

7. This sets up Flash CS4 to be “listening” for a mouse click on the but_home instance and then execute a function named onHome. Nothing will happen yet (we haven’t written the functions), but we are telling Flash to notice any mouse clicks on the but_home instance and then execute the onHome function.

Lets add three more Event Listeners, one for each of the remaining buttons.

In the Actions panel, type:

```
but_module1.addEventListener(MouseEvent.CLICK, onMod1);
```

```
but_module2.addEventListener(MouseEvent.CLICK, onMod2);
```

```
but_test.addEventListener(MouseEvent.CLICK, onTest);
```

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- Now that we have ActionScript listening for clicks, let's add the function code to respond to each of these clicks.
- In the Actions panel, press [Enter] twice to add some space between the listeners and the function code you are about to write.
- On line 6 of the Actions panel, type:

```
function onHome(event:MouseEvent):void
{
    gotoAndStop("home");
}
```

```
function onMod1(event:MouseEvent):void
{
    gotoAndStop("module1");
}
```

```
function onMod2(event:MouseEvent):void
{
    gotoAndStop("module2");
}
```

```
function onTest(event:MouseEvent):void
{
    gotoAndStop("test");
}
```

- Be sure the frame label ("home") in the ActionScript is typed exactly the same as the frame label you put into each frame. "Home" or "HOME" is not the same as "home".
- At the bottom of your code stack, type:

```
stop();
```

This will keep your file stopped at the first frame.

- Save your file.
- Test your movie. Click Control -> Test Movie.
- When you click on each button, it jumps to and then stops at the labeled frame.

Module 3: Frame Navigation

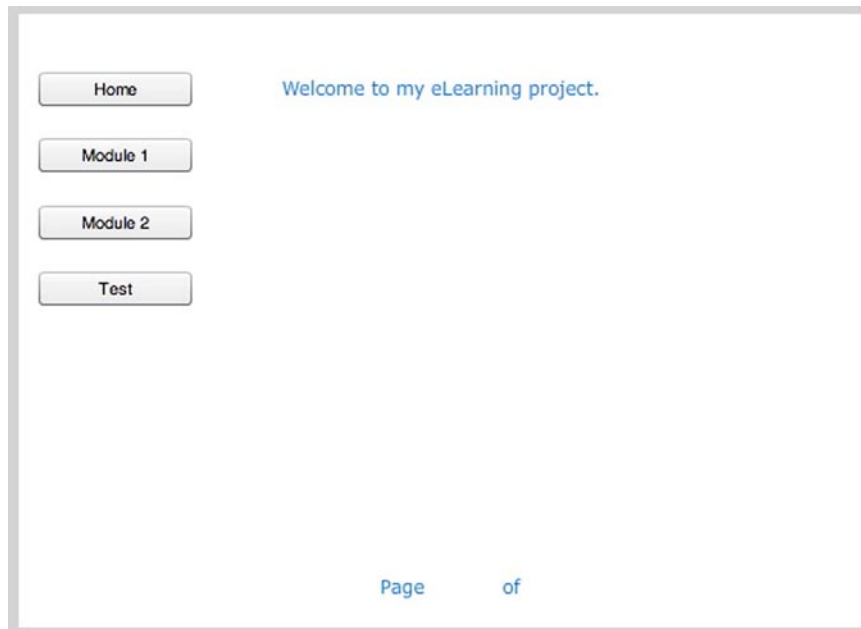
Now that we have the main buttons working correctly, lets add some interactivity that allows the user to navigate from frame to frame and show them a page counter. Let's do it all in ActionScript!

Action 1: Create the Navigation Shell

1. Lock the Actions layer of your movie.
2. Unlock the Navigation layer.
3. Click on Frame 1 of the Navigation layer.
4. Click on the text tool.
5. Click into the stage and type:

Page of

Be sure to leave space between "Page" and "of".



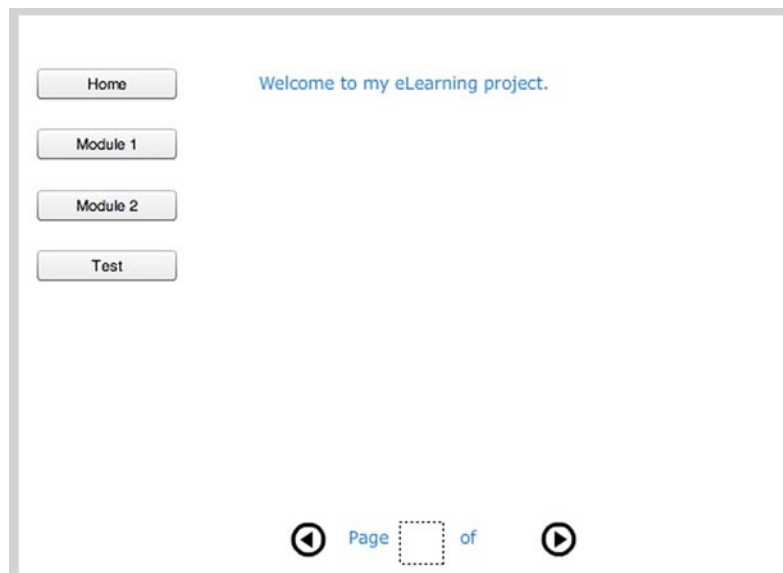
6. Click on Window -> Common Libraries -> Buttons to open the Buttons panel.

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7. Scroll down until you find the folder called Classic Buttons. Click on the folder to open it.
8. Inside the Classic Buttons folder, locate and open the folder called Circle Buttons. Drag an instance of **circle button-next** onto the stage. Position it to the right of the “page” text.
9. Drag an instance of the **circle button-previous** onto the stage. Position it to the left of the “page” text.
10. Click on the circle button-next instance and in the Properties Inspector, change the instance name to:

`but_next`
11. Click on the circle button-previous and in the Properties Inspector, change the instance name to:

`but_back`
12. Close the Classic Buttons panel.
13. Click on the Text tool. In the Properties Inspector, change the drop down from Static Text to Dynamic Text. We are going to auto-populate text into a Dynamic Text box.
14. With the Text tool draw a square dynamic text box on the stage. Position it between the “page” and “of” text.



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15. Using the selection tool (black arrow), click on the dynamic text box. In the Properties Inspector, change the instance name to:

```
myLocation
```

16. With the text tool, draw a second dynamic text box behind the “of” text.
16. Using the selection tool, click on the second dynamic text box. In the Properties Inspector, change the instance name to:

```
myTotalPages
```

17. You are all set! The dynamic text boxes will be populated with variables so all we need to do is add the code!

Action 2: Create the Navigation Code

1. Lock the Navigation layer in your movie.
2. Unlock the Actions layer. Click onto frame 1 of the Actions layer.
3. Open the Actions panel (if it isn't already opened).
4. Place your cursor at the start of code line 1, (in front of the button code currently there).
5. Press [Enter] a few times to give yourself some room to add additional code.
6. Type the following code into the Actions Pane:

```
var frames:Number;  
var totals:Number;  
frames=currentFrame;  
totals=totalFrames;  
myLocation.text=(String(frames));  
myTotalPages.text=(String(totals));
```

The first two lines set the variables frames and totals to be recognized as a number.

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We then use the global variables `currentFrame` and `totalFrame` and assign them to our variables of frames and totals.

In order for the dynamic text boxes to display the numbers, we have to convert them to Strings. The last two lines do this for us.

7. Now that we have the dynamic text boxes working, let's program the buttons.
8. Let's first create the listener code for the two buttons. At the bottom of the listener code stack, add the following two new lines of ActionScript.

```
but_next.addEventListener(MouseEvent.CLICK, goNext);  
but_back.addEventListener(MouseEvent.CLICK, goBack);
```

9. Next, we will add the functions `goNext` and `goBack` to react when the buttons are clicked. At the bottom of the function stack, add the following functions.

```
function goNext(event:MouseEvent):void {  
    nextFrame();  
    frames=currentFrame;  
    myLocation.text=(String(frames));  
}  
  
function goBack(event:MouseEvent):void {  
    prevFrame();  
    frames=currentFrame;  
    myLocation.text=(String(frames));  
}
```

10. Save your movie.
11. Test your movie. Your bottom button navigation should work as expected.

Action 3: Bug Fix

1. When you tested your movie, did you notice that when you clicked on the large buttons, the page numbers got messed up. When clicking on the major module navigation, Flash couldn't figure out which page number to display. Let's fix that.

2. On the Actions layer, right mouse click on frame 10 and insert a keyframe.

3. Add the following code to the keyframe in frame 10 of the Actions layer:

```
frames=currentFrame;  
myLocation.text=(String(frames));
```

4. Now, when the user interacts with the large module buttons and jumps down the timeline, the myLocation dynamic text box updates with the current frame number.

5. Let's repeat that for frames 20 and 30.

6. On the Actions layer, right mouse click on frame 20 and insert a keyframe.

7. Add the following code to the keyframe in frame 20 of the Actions layer:

```
frames=currentFrame;  
myLocation.text=(String(frames));
```

8. On the Actions layer, right mouse click on frame 30 and insert a keyframe.

9. Add the following code to the keyframe in frame 30 of the Actions layer:

```
frames=currentFrame;  
myLocation.text=(String(frames));
```

10. Save and test your movie. Your navigation now works as expected!

11. Congratulations! You have programmed a functional interface in ActionScript 3.0!

Summary

Flash is a great tool for eLearning, and utilizing ActionScript makes it a powerful tool to add interactivity. Don't be afraid of the code. As you discovered in this session, ActionScript is a logical language. You need to be able to utilize pseudo-code as a starting point, then figure out the ActionScript you need to make it all work. Several resources are listed below to help you in your development.

Recommended Web Sites and Reading

Flashkit

A fantastic web site dedicated to all things Flash. If you want to start learning Flash, or just want to download and use some animations in your sites, this is **the** place on the web for Flash stuff.

<http://www.flashkit.com>

Friends of Ed

Friends of Ed is a publishing group out of the UK that has a fantastic set of books on Flash, from version MX to the current version CS4. They are a “developer to developer” group of authors that really give you good, usable information on the product. I recommend starting with the Flash CS4 for Designers and then move through their ranks of books. They cover everything from Basic ActionScript to advanced database interactivity.

You can find their stuff on-line or wherever you buy your computer books.

<http://www.friendsofed.com>

Adobe Web Site

Macromedia has a very good web site that can give you more information about Flash. You can also download a fully functional version of Flash CS4 to try for 30 days. It is the perfect way to immerse yourself in the product before deciding to spend the money to purchase it.

<http://www.adobe.com>

Peach Pit Press

Peach Pit Press has a large number of Visual Quick Start Guides on all things computer, and the two Flash Quick Start Guides are really good (and cheap!)

<http://www.peachpit.com>