

## Chapter 17

# Computers in the Classroom: Designing and Producing Customized Instructional Multimedia

*Ruth E. Beattie*

T. H. Morgan School of Biological Sciences  
University of Kentucky. Lexington, KY 40506  
Telephone: (606)-257-7647  
E-mail: [rebeat1@pop.uky.edu](mailto:rebeat1@pop.uky.edu)

Ruth E. Beattie is an Assistant Professor of Biology at the University of Kentucky. She received a B.A. and an M.Sc. in Biochemistry from Trinity College Dublin, Ireland, and a Ph.D. in Biochemistry from Queen's University Belfast, N. Ireland. She completed two postdoctoral fellowships at The Hipple Cancer Research Center and at Wright State University in Dayton, Ohio. She then taught for four years at Ball State University, Muncie, Indiana. In the Fall of 1995 Dr. Beattie joined the faculty at the University of Kentucky as an instructional specialist, where her primary responsibility is teaching large enrollment freshman level biology classes. Dr. Beattie has developed a variety of innovative classroom activities, which have been successfully implemented in these large classes.

**Reprinted From:** Beattie, R. E. 1999. Computers in the classroom: Designing and producing customized instructional multimedia. Pages 301-326, *in* Tested studies for laboratory teaching, Volume 20 (S. J. Karcher, Editor). Proceedings of the 20<sup>th</sup> Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 399 pages.

- Copyright policy: <http://www.zoo.utoronto.ca/able/volumes/copyright.htm>

Although the laboratory exercises in ABLE proceedings volumes have been tested and due consideration has been given to safety, individuals performing these exercises must assume all responsibility for risk. The Association for Biology Laboratory Education (ABLE) disclaims any liability with regards to safety in connection with the use of the exercises in its proceedings volumes.

© 1999 Ruth E. Beattie

Association for Biology Laboratory Education (ABLE) ~ <http://www.zoo.utoronto.ca/able>

## Contents

Introduction	
Role of Multimedia in Course Curricula .....	302
Development Steps .....	302
Design Considerations .....	303
Designing a Program .....	304
Evaluation of the Project .....	305
Workshop Activity - Designing a Program .....	305
Required Materials.....	307
Working with Authorware - The Basics .....	308
Program Production Instructions .....	310

## Introduction

### Role of Multimedia in Course Curricula

The availability, variety, and quality of specialized instructional multimedia has increased dramatically during the past few years. In addition, many instructors are producing customized instructional multimedia for their own courses. During the past twelve months, the author has begun the design and production of an interactive multimedia program for use in the Principles of Biology I course taught at the University of Kentucky.

Whether using a commercially purchased program or a custom designed program it is important to link the use of the multimedia to the course instructional objectives. Multimedia is a tool for teaching, not necessarily a solution for teaching problems. Multimedia is only as effective as the instructor using it is. The instructor must distinguish between entertaining the students and teaching the students. It is very easy for the message of the material to be lost in the gimmicks and glitz of the program package. Great care must be taken when choosing and/or designing multimedia for instructional purposes.

### Development Steps

There are four major development steps that must be considered when embarking on a project involving the production of instructional media:

1. *Identify Need*
  - a) What course will the program be used in?
  - b) What instructional objectives will be addressed?
  - c) Is there a comparable commercially available program? There is no point in investing a lot of time, energy, and creativity into designing a program that is already available commercially.
  - d) What are the instructor's goals for the use of the program?

2. *Funding*

Identify grant-awarding agencies or programs within your institution that fund this type of project. The University of Kentucky has a Faculty Associates Program that sponsors projects involving the development of instructional resources. Based on experience, the author strongly recommends including a line item in the budget for the hiring of a technician (student worker) to assist in the production stage of the project. It can take a considerable amount of time to become familiar with the use of publishing software. The design and production of even a small multimedia package can be very time consuming, especially if this is the first project of this type being undertaken.

### 3. *Hardware / Software Requirements*

The minimum requirements for a multimedia design project are:

- Computer
- Flat bed scanner / slide scanner / digital camera - depending on the source of images.
- Zip drive and Zip discs (or equivalent) - Multimedia files can be very large and will very quickly exceed the capacity of a 1.44-MB diskette. Zip discs have a capacity of 100 MB.
- Publishing software of your choice.
- Optional - video and sound capture hardware and software.

### 4. *Technical Assistance*

Unless the designer is very familiar with the chosen publishing software, it is strongly recommended that a readily accessible source of technical expertise be identified and consulted about the project. Do not depend on having your problems solved through the help line of the software provider.

## Design Considerations

Before beginning to design any media, some preliminary research needs to be conducted.

### 1. *Review commercially available multimedia programs*

Make a list of the good and bad features of the programs. Consult this list often when designing a program. Demonstration copies of many instructional programs can be obtained through the product supplier. Not all of these programs need be specific to biology. Ask students for their opinions regarding the programs. Would they use the programs if they were available?

Points to note:

- Color combinations
- Readability - print size and style?
- Do the images have good resolution?
- Are there any distracting features?
- Is it easy to navigate through the program?
- Is the sound too loud? Does the sound cause a distraction?
- Quality of video?
- Does the program address its stated objectives?

### 2. *Determine the computer literacy of the students who will be using the product*

- How many students have access to a computer?
- How many students have computers (with CD drives) at home?
- How many students are comfortable using a computer?

### 3. *Identify the instructional objectives that will be addressed through the use of this program.*

### 4. *Identify how the program will be used.*

Will the program be used primarily for classroom instruction or by individual students in a computer laboratory? Material being used for classroom instruction needs to be designed such that it projects clearly. Font size needs to be larger, and text less expansive. Remember: Students write down every word that is projected in the classroom.

### 5. *Identify the platform (PC or Mac or both) that the program will be used on.*

### 6. *Choose the publishing software*

The author chose the publishing software **Authorware** for the following reasons:

- The software had all the interactive features (buttons, animations, hot spots, target areas, click-and-drag) that were to be included in the finished program.
- The software would produce a cross-platform (PC and Mac) product.
- Technical assistance from experienced Authorware users was available on campus.
- Experienced multimedia designers recommended this software as the most user-friendly, and the easiest software to learn.

## Designing a Program

Before the content of a program is written, some basic design decisions need to be made. It is very important that these decisions be made up front as it can cause major problems later on if the basic design of the project has not been laid out.

### *Basic layout*

Will the program have the same format through out? For example: Will the navigation buttons be of the same type and in the same location? Will the text be in the same location? Where will images or videos be located? What will be the color scheme? Will different chapters be color-coded?

### *Pacing of the program*

Will the program be learner-paced or program-paced? Can the student spend as much time as she/he needs on one screen before moving to the next or will the screens scroll forward automatically after a set time period?

### *Navigation*

What type of navigation controls will be employed? Will the students be able to move both forward and backward within the program, or will they be locked into a one-way presentation? Can they quit at any time? Bad navigation controls can be the death knell for a program.

### *Sound and video*

Will the program include sound files? If it does, will this pose a problem in computer laboratories? The computers will all need to have soundcards. Do the computer laboratories have headphones that can be used by the students? It is very distracting to a student, who is working on a paper, to be sitting next to a person who is working with 'noisy' software. Can the sound be muted (easily)? What about video files? They can take up a lot of disc space. Is the video worth the space?

### *Images and graphics*

What images will be required? Copyright Law forbids the scanning of images from textbooks, journals etc., and their insertion into a program that will be widely distributed. This even applies to distribution within a class. Double check that the use of all images, videos, and sound tracks is legal and not in violation of copyright law.

### *Level of interactivity*

What level of interactivity best suits the program? Some programs contain a high level of interactivity where the students can choose their own course through the program. Other programs, by necessity, are linear in that the student must work through a series of screens in a set sequence. The level of interactivity chosen will depend on the content. If a laboratory procedure is being described then this information must be presented in a set sequence and therefore in a linear format. Other material will lend itself to a higher level of interactivity.

## **Evaluation of the Project**

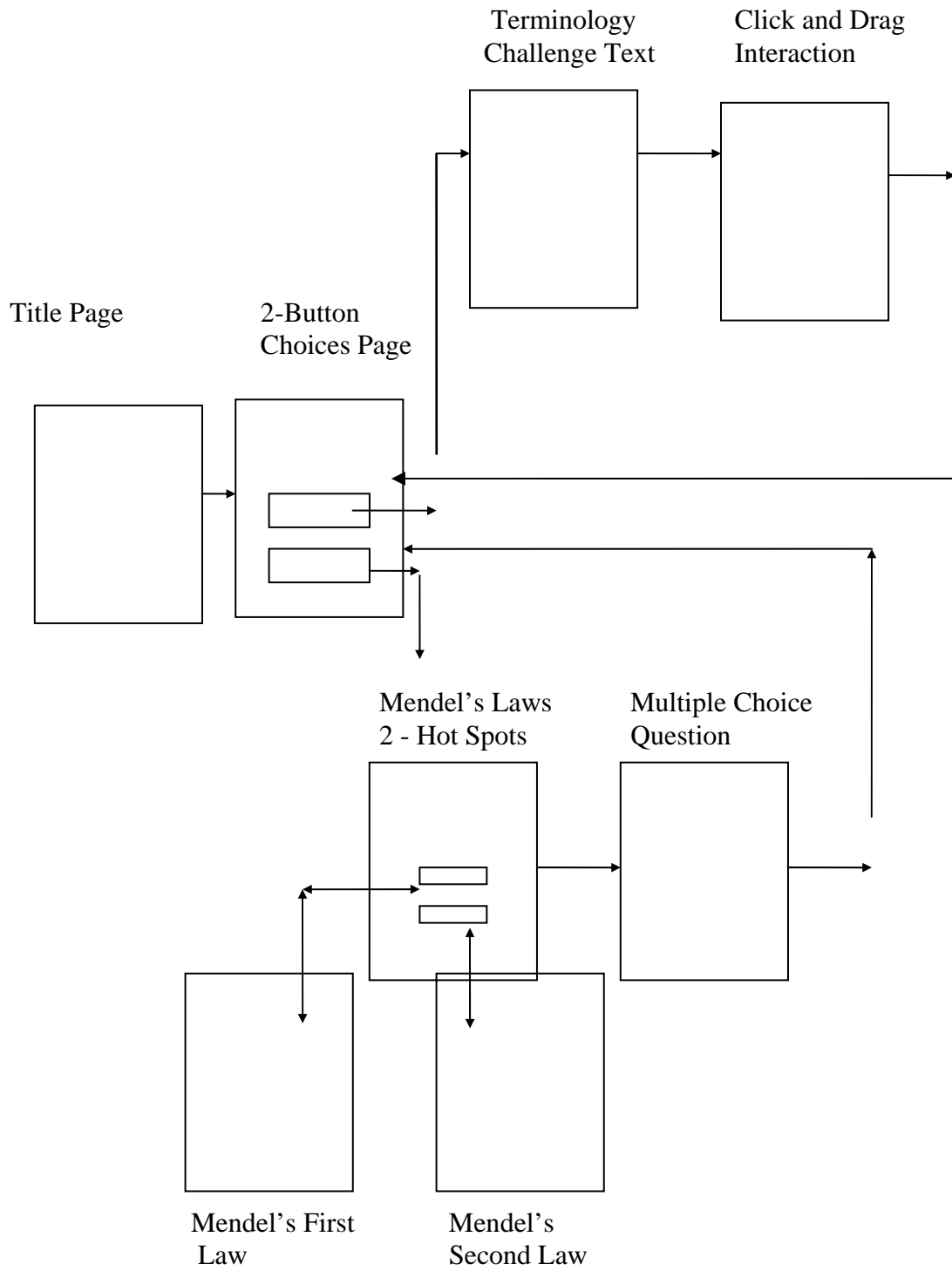
It is important that the project include some form of evaluation. Assessment techniques should be chosen based on their appropriateness in evaluating the stated goals for the use of the program. These techniques could include:

- Pre / post testing to assess student learning
- Administration of student opinion surveys
- Documenting instructor observations and reactions

## **Workshop Activity - Designing a Program**

The first step in designing any multimedia product is to identify how the product is going to be used and by whom. The design features of the multimedia product should be chosen based on the most appropriate features for the target audience. Before any computer input is carried out, it is critical that the entire product be planned and scripted on paper first. This allows the designer to choose the navigation style and overall layout of the program. It is important to take the time to script out the program at this stage. The script should include the text, placement of buttons, font color, style, and size, background color / design, and choice of images, video, and sound.

During this workshop, a short interactive program will be designed and produced. This program includes the use of buttons, hot spots, click-and-drag interactions, and target areas. The program begins with a title page which leads to a second page (2-button choices page) involving an interaction with buttons. The user chooses between two content areas (Genetics Terminology and Mendel's Laws). Each of these buttons leads to a page containing some text and then into an interaction (click-and-drag or target areas/multiple choice question). The entire program is summarized in Figure 17.1. Note: This program has been designed to give workshop participants maximum exposure to the programming process and should not necessarily be used as a template for further projects. The designer should choose an appropriate sequence of interactions based on the instructional goals of the planned product.



**Figure 17.1.** Program Layout

## Materials Required

*Authorware Academic*, version 3.5  
Prentice Hall  
200 Old Tappin Rd.  
Old Tappin, NJ 07675  
Telephone: 1-800-922-0579  
E-mail: <http://www.prenhall.com>

*Authorware*, version 4.0, working model version  
Macromedia, Inc.  
600 Townsend Street,  
San Francisco, CA 94103  
Telephone: 415-252-2000  
E-mail: <http://www.macromedia.com>

*Authorware*, version 4.0, full version  
Macromedia, Inc. (address listed above) or from most computer software stores.

### *Authorware* Software.

A number of different versions of the software are currently available: a) *Authorware 4.0* (full version, cost \$499.00); b) *Authorware Academic*, v3.5 (cost \$150.00, available only through Prentice Hall Publishing Company); and c) *Authorware 4.0* Working Model (available free from Macromedia, but this version has very limited capabilities). The particular program designed in this workshop can be produced using the working model version.

Some of the differences between the full version and the academic version are: (1) it is more difficult to package programs using the academic version. The advantage to being able to package programs is that the users of the program do not need to have *Authorware* on their computers to be able to run the program. All the files needed to run the program are included in the packaged program.; (2) the academic version does not have a spellchecker; (3) there is a limit to the number of icons that can be used in programs designed using the academic version (350) and the working model version (50). If you can afford it, I would recommend obtaining the full version of the software.

Computer, either PC or Mac Platform.

*Authorware* projects can be designed on either platform and the end product can be packaged for both platforms. A program designed on a Mac can be packaged for use on a PC. Be aware that some fonts do not appear the same on both platforms, and check that color palettes are compatible. In this workshop, the production was carried out on a PC platform using the working model version. The instructions for the Mac platform are the same as for the PC but some of the screen images may vary slightly from those found in this paper.

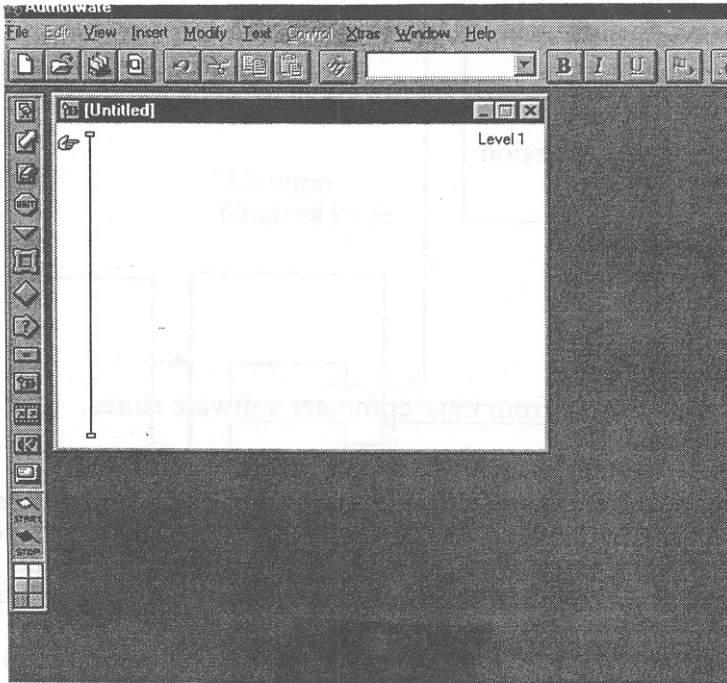
Formatted Discs - this particular program will fit (unpacked) onto a single disc.

Paper and colored pens for scripting

Image files - to insert images into the program.

## Working with Authorware - The Basics

When Authorware is launched a design window, as shown below, appears.



**Figure 17.2.** Authorware Design Window

Dragging icons to the flow line assembles the program being designed. There are 13 different icons that can be utilized. In the program being designed in this workshop, only six of these icons will be used. The six icons are:

The display icon (Figure 17.3.), which is used to display text, graphics etc.



**Figure 17.3.** Display Icon

The navigation icon (Figure 17.4.) is used to set up navigation links (buttons, hot spots, target areas) to icons attached to a framework.



**Figure 17.4.** Navigation Icon

The framework icon (Figure 17.5.) is used to set up a common set of navigation controls.





**Figure 17.5.** Framework Icon

The interaction icon (Figure 17.6.) is used to set up interactions (buttons, hot spots, target areas, click and drag, multiple-choice questions).



**Figure 17.6.** Interaction Icon

The calculation icon (Figure 17.7.) is used (in this particular program) to execute the **Quit** option.



**Figure 17.7.** Calculation Icon

The map icon (Figure 17.8.) is used to group a number of icons. This makes organization of the entire file much easier.



**Figure 17.8.** Map Icon

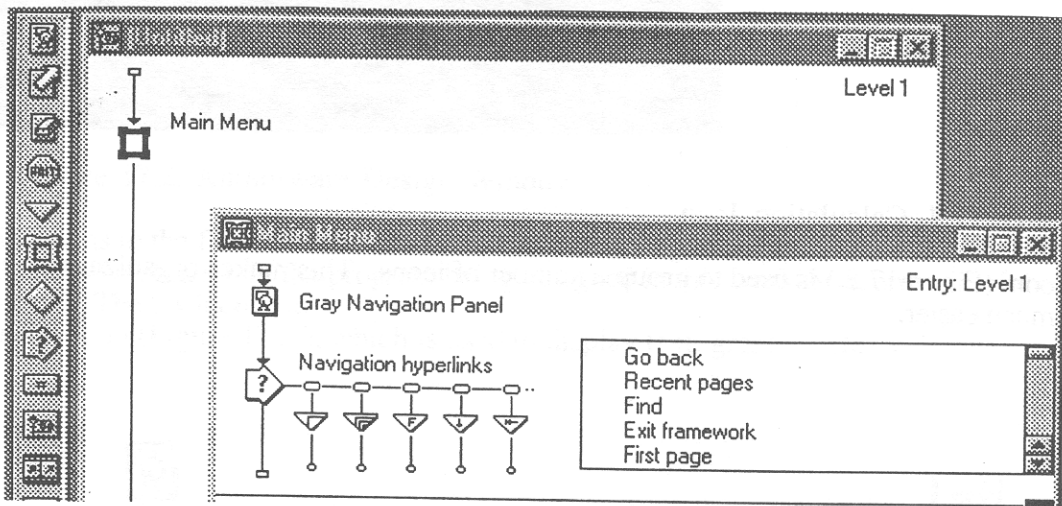
Each icon that is dragged to the flow line must be labeled with a unique title. This is essential for correct navigation within the program. Titles should be as explicit as possible. This makes it easier to keep track of where you are in a program. To label an icon, click once on the default title to highlight it, then type in the new title. Generally, but not always, the label is automatically highlighted when an icon is placed on the flowline. It saves a lot of time and future confusion if icons are labeled as soon as they are placed on the flowline. To open an icon, double click on it.

Save often. Get in the habit of saving after every manipulation. As you design your program it is beneficial to check periodically that the navigation controls are working correctly and that the display screens appear as expected. You can run your program by first clicking on **Control** from

the menu. Click **Restart** on the pull down menu that appears. If you do not want to run the program from the beginning each time, place the white flag on the flowline where you want the program to start and then choose **Restart from flag** on the pull down menu. The program will automatically stop wherever it encounters a problem. You may have forgotten to tell a button where to navigate to or you may have forgotten to add text to a display screen. The program automatically stops if it encounters an empty display screen. Because the program stops whenever it encounters a problem, you can correct the program before those errors become major problems. This software takes time to learn. Do not expect to be able to design a large program in a few hours. Be patient. The wait is worth it.

### Program Production Instructions

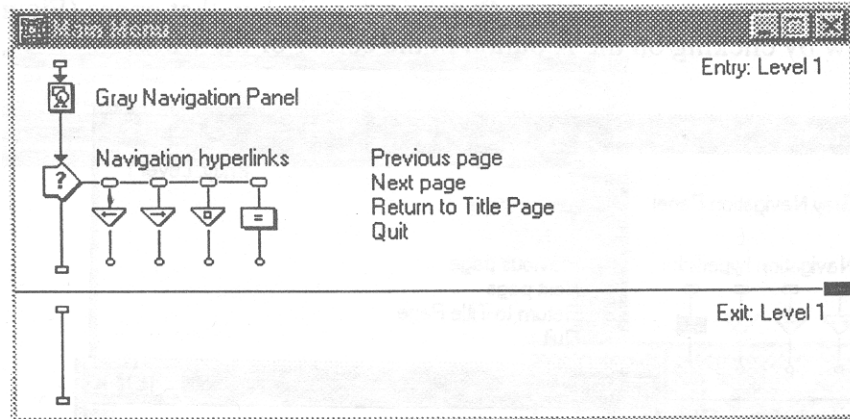
1. Open Authorware. Go to **Modify**, choose **File**, and then choose **Properties**. On the screen that appears unclick **Title Bar** and **Menu Bar**. Click **Okay**. This removes the menu bar and title bar from display screens. Drag a framework icon to the flow line. Label the icon **Main Menu**.
2. Double click on this icon. This opens the navigation setting window (Figure 17.9.).



**Figure 17.9.** Navigation Setting Window

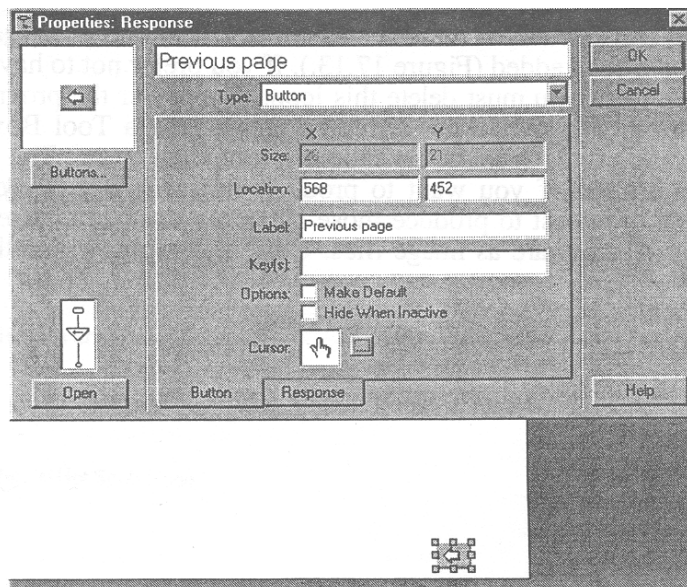
3. Go to the navigate icons and delete all icons except for the **Next Page** and **Previous Page** icons. To delete an icon, click on it once to highlight it, then delete it using the delete key. Save.
4. Drag a navigate icon onto the navigation line and place it beside the **Next Page** navigate icon. Label it **Return to Title Page**. Save.

5. Drag a calculation icon to the navigation line. Label it **Quit** (Figure 17.10.). Save.



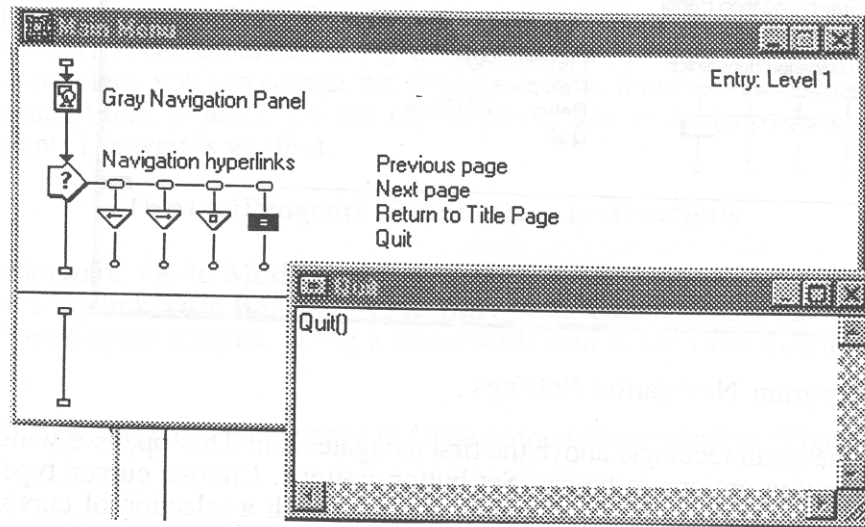
**Figure 17.10.** Program Navigation Settings

6. Double click on the small rectangle above the first navigate icon. This opens a window (Figure 11.) that allows button options to be set. Set button options. Choose cursor type and button type. To select a cursor type, click on **Cursor**. A screen with a selection of cursor styles will appear. Click on the cursor of your choice, and then click **OK** to close this screen. Repeat for button type. The selected button will appear on the display screen behind this window. Click on the button, hold and drag it to the desired location. Click **Okay**. Save.



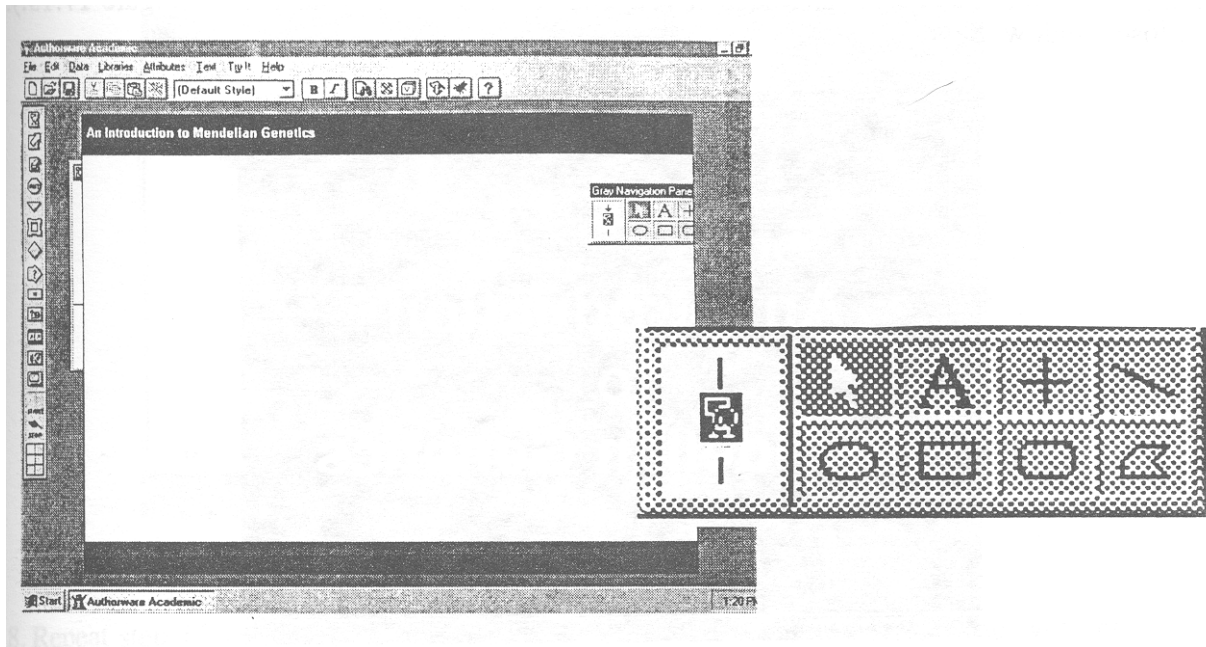
**Figure 17.11.** Button Options Window

7. Repeat step 6 for each of the other two navigate icons and for the calculation icon.
8. Double click on the calculation icon. Type **Quit()** in the window that opens (Figure 17.12.). Close the window by clicking on the **X** button in the corner of the window. Save.



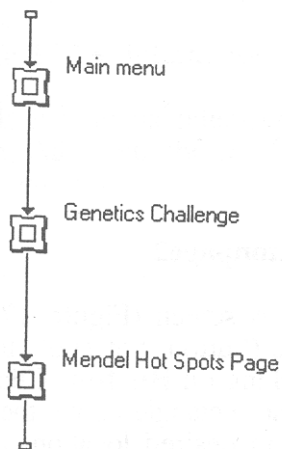
**Figure 17.12.** Calculation Icon Window

9. Double click on the display icon labeled **Gray Navigation Panel**. This opens a display screen, which functions as the background for subsequent display screens. This is what the user of the program will see when they are running the finished product. In this particular program, a header label (An Introduction to Mendelian Genetics) and a navigation bar (at the bottom of the screen) have been added (Figure 17.13.). If you prefer not to have these types of features on subsequent screens you must delete this icon. Remember the program will not run if a display screen is left blank. When the display screen opens a Tool Box (Figure 17.13 Insert) containing the editing tools appears. To choose a tool click on it. The tool selection (7 tools) in Authorware is limited. If you want to produce diagrams and figures that require a greater selection of tools, it is best to produce those diagrams using a different program and then to import them into Authorware as image files. Close this window and the **Main Menu** window. Save.



**Figure 17.13.** Default Screen Display and Tool Box (Insert)

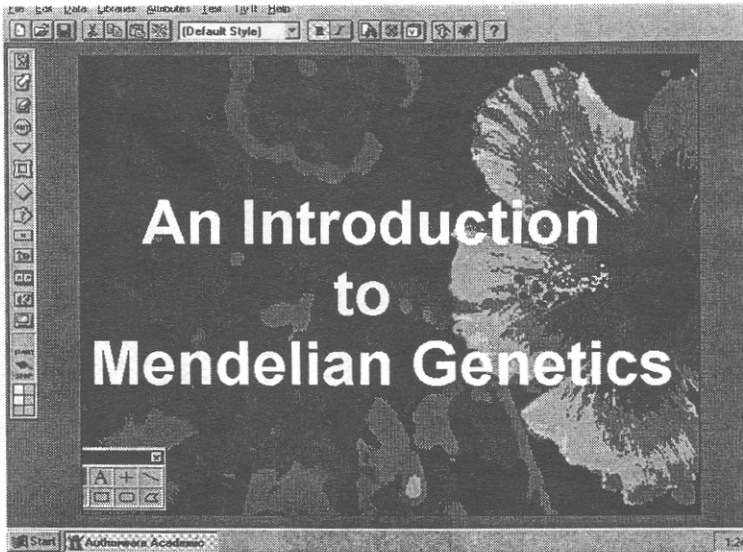
10. Copy this **Main Menu** framework icon twice onto the flow line. Label the second framework icon **Genetics Challenge** and the third framework icon **Mendel Hotspots Page** (Figure 17.14.). Save.



**Figure 17.14.** Flowline

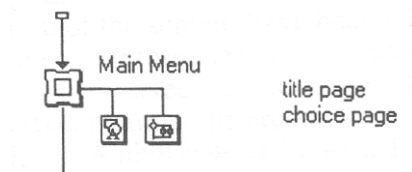
11. Drag a display icon to the **Main Menu** framework icon. Label it **Title Page**.
12. Double click on the display icon. This will open the display area.

13. Import into the display area an image of your choice. Add text of your choice (Figure 17.15.). Close window. Save.



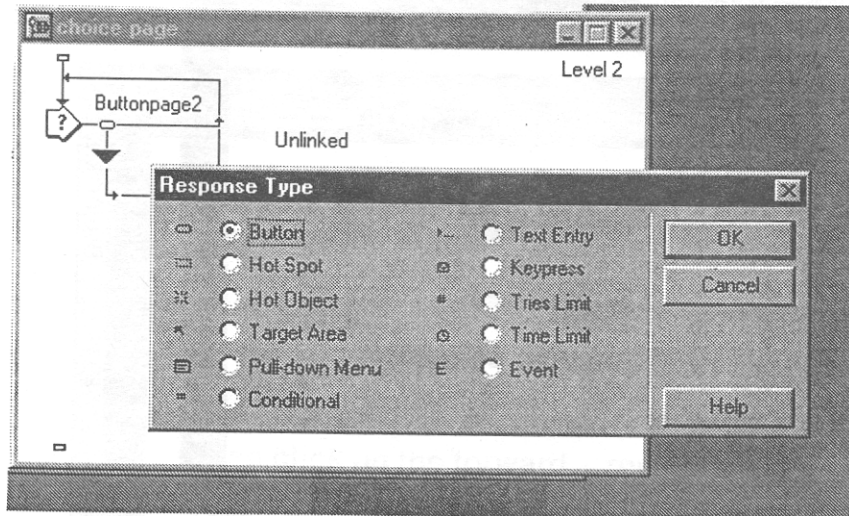
**Figure 17.15.** Title Page Display Screen

14. Drag a map icon and place it beside the **Title Page** display icon. Label this icon **Choice Page** (Figure 17.16.). Save.



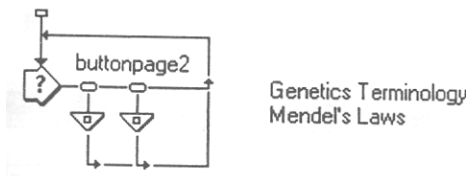
**Figure 17.16.** Main Menu Flowline

15. Open the map icon window by clicking on the icon.
16. Drag an interaction icon onto the flow line. Label this icon **Buttonpage2**.
17. Drag a navigate icon and place it beside the interaction icon. A screen (Figure 17.17) will automatically appear asking you to choose the type of response (button, hot spot, target area etc) for this interaction. Choose response type (**Button**) by clicking on **Button**. Click **Okay**. Label this navigate icon **Genetics Terminology**. Click on the rectangle above the navigate icon and set button options as in Step 6 above. Place button in desired location on screen. Close window. Save.



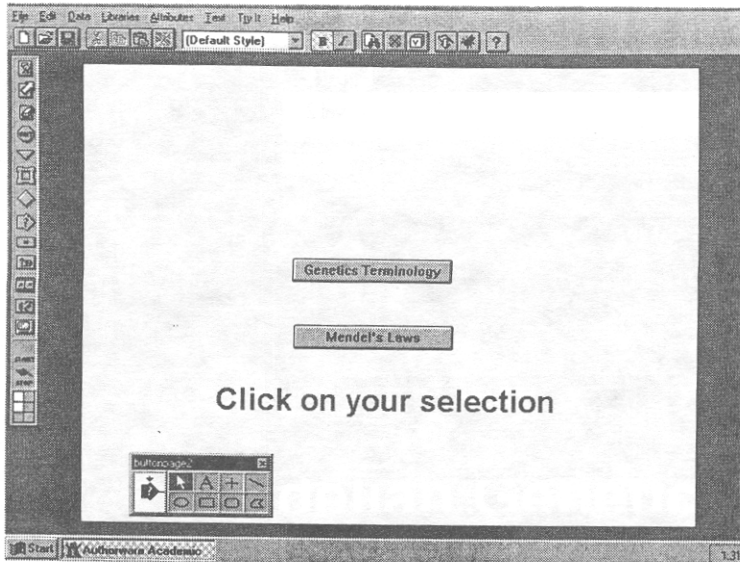
**Figure 17.17.** Response Type Window

18. Repeat step 17 for a second navigate icon labeled **Mendel's Laws**. You will not have to choose a response type for this icon, it will automatically default to button. The flowline for the complete interaction is shown in Figure 17.18.



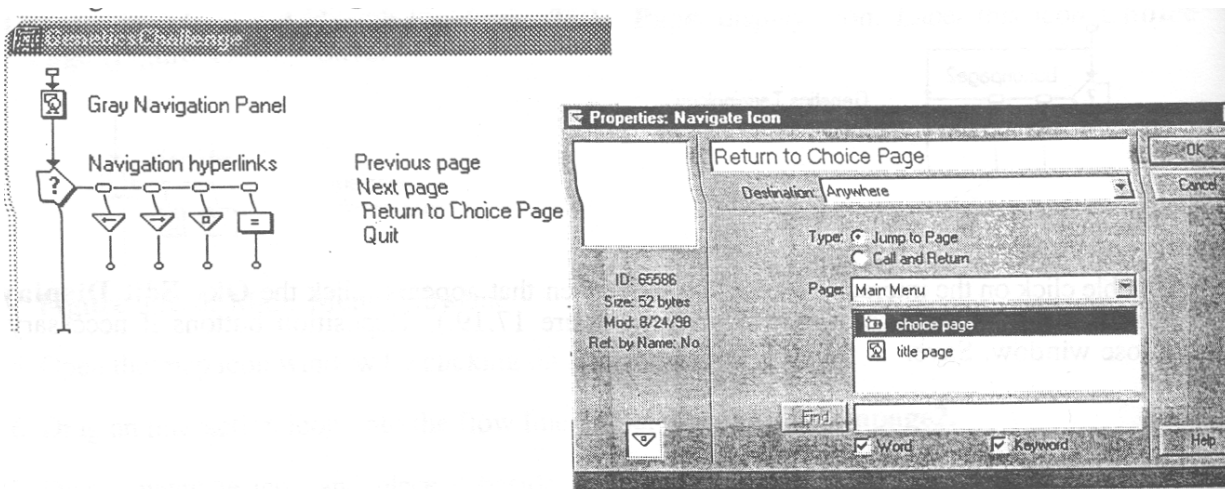
**Figure 17.18.** Interaction Flowline

19. Double click on the interaction icon. On the screen that appears, click the **Ok- Edit Display** button. Add your choice of text to screen (Figure 17.19.). Reposition buttons if necessary. Close window. Save.



**Figure 17.19.** Screen display for 2-button page

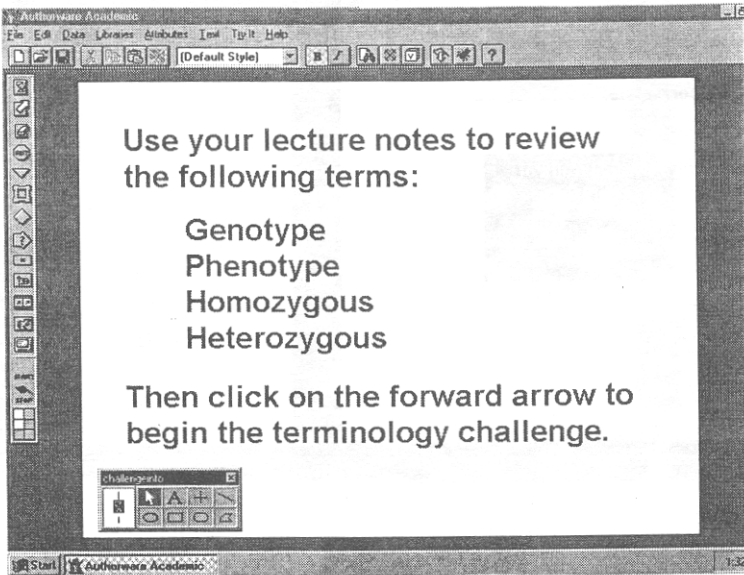
20. Double click on the **Genetics Challenge** framework icon. Rename the **Return to Main Menu** button - label it **Return to Choice Page**. Double click on this navigate icon and set navigation to **Choice Page** (Figure 17.20.). Click **Okay**. Save.



**Figure 17.20.** Navigation Settings

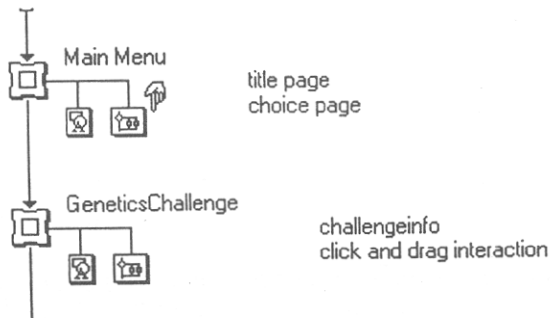
21. Place a display icon beside this framework icon. Label it **ChallengeInfo**. Open the display icon and add text of your choice (Figure 17.21). Close window. Save.





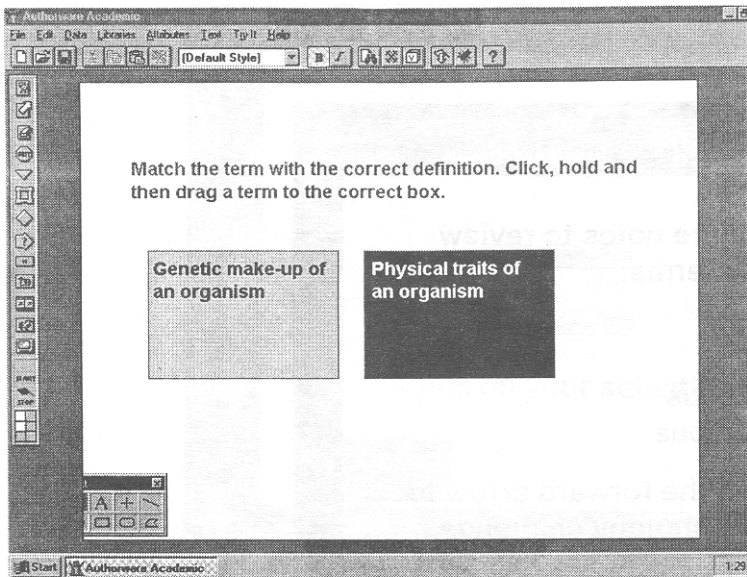
**Figure 17.21.** Screen display for ChallengeInfo page

22. Drag a map icon and place it beside the **ChallengeInfo** display icon. Label the map icon **Click and Drag Interaction**. Save. The flowline is shown in Figure 17.22.



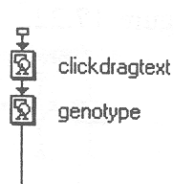
**Figure 17.22.** Genetics Challenge Flowline

23. Double click on the **Click and Drag Interaction** map icon to open it. Drag a display icon to the flow line. Label it **Clickdrag Text**. Open the display icon and add text of your choice (Figure 17.23.). Close window. Save.

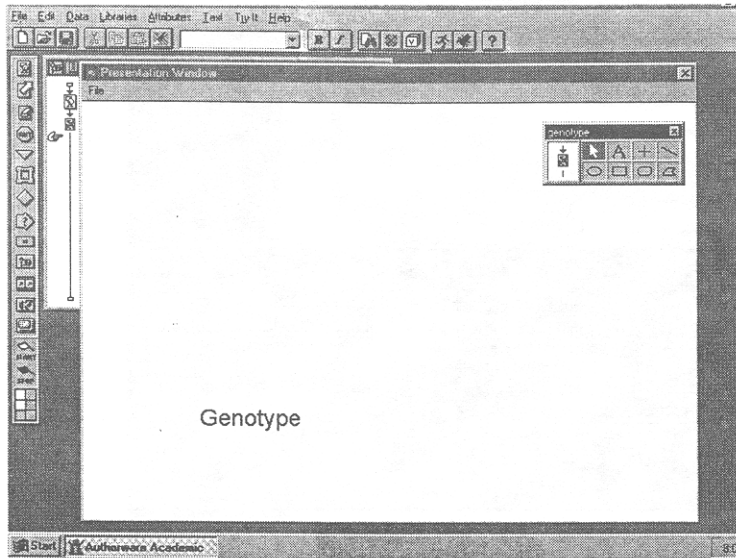


**Figure 17.23.** Clickdrag Text Display Screen

24. Drag a display icon to the flow line. Place it below the icon labeled **clickdrag text** (Figure 17.24). Label this icon **Genotype**. Open this display icon and type **genotype** or the word of your choice that is going to be dragged (Figure 17.25). Close window. Save.



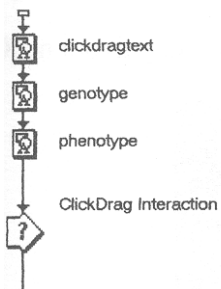
**Figure 17.24.** Flowline



**Figure 17.25.** Genotype Display Screen

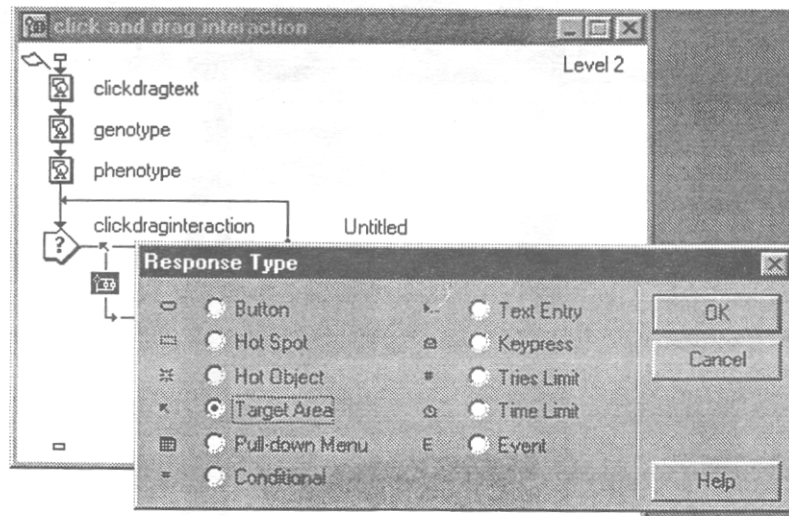
25. Repeat step 24 for a display icon labeled **Phenotype**.

26. Drag an interaction icon to the flow line. Label it **ClickDrag Interaction** (Figure 17.26).



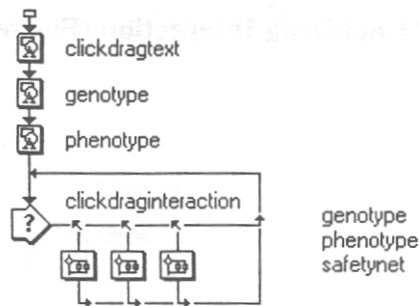
**Figure 17.26.** Flowline

27. Place a map icon beside the interaction icon. Choose response type (**Target Area**) (Figure 17.27.). Click **Okay**. Label this icon **Genotype**. Save.



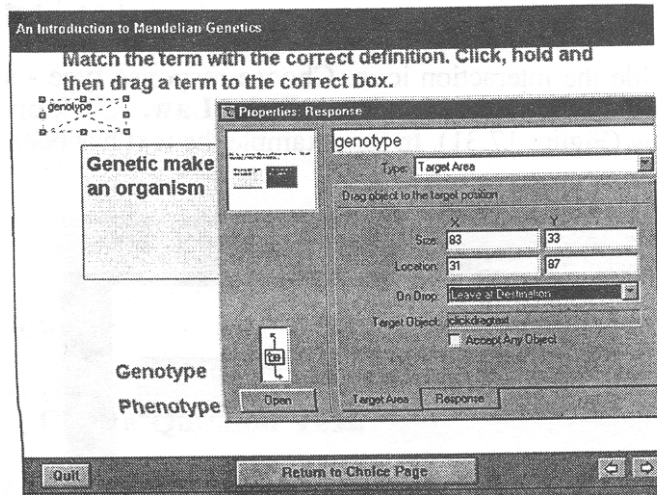
**Figure 17.27.** Response Type Screen

28. Repeat step 27 for two more map icons. Label the second icon **Phenotype** and the third icon **Safetynet** (Figure 17.28).



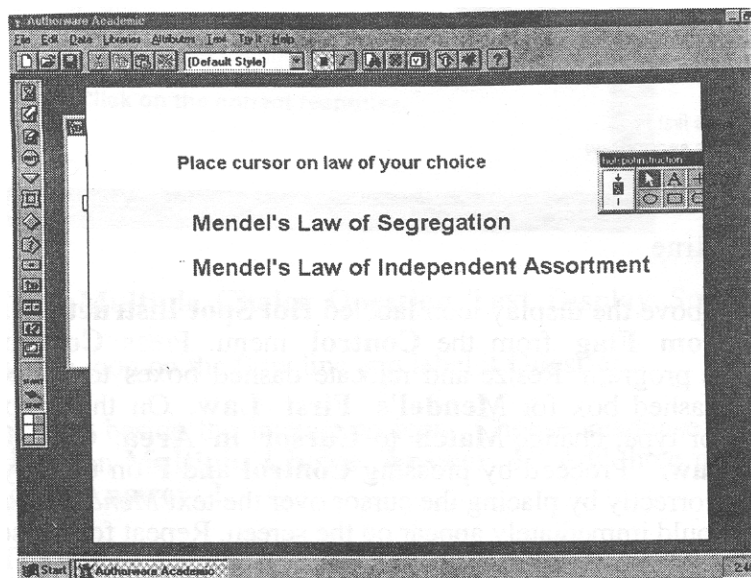
**Figure 17.28.** Flowline for Click and Drag Interaction

29. Place the white flag above the display icon labeled **Clickdragtext**. Run program by choosing **Restart from flag** from the **Control** menu. The program will stop because the properties for the interaction have not been set. The properties should be set such that an object dragged to the correct location on the screen stays there but an object dragged to the incorrect location returns to its original location on the screen. A **Properties: Response** screen will appear. Change **On Drop** to **Leave at Destination**. Click on **Response** tab at the bottom of the screen. Change **Status** to **Correct Response**. Size the dashed box (labeled Genotype) on the screen to the correct target area (Figure 17.29.) for the response **Genotype**. The target area can be resized by dragging the corners of the dashed target area. Click **Okay**. The properties screen for **Phenotype** will now appear. Change settings as detailed above. Click **Okay**. The properties screen for **Safetynet** will now appear. Change **On Drop** to **Put Back**, and **Status** to **Not Judged**. Resize the dashed box to enclose the entire area of the screen. Click **Okay**. Save



**Figure 17.29.** Target Area Options Screen

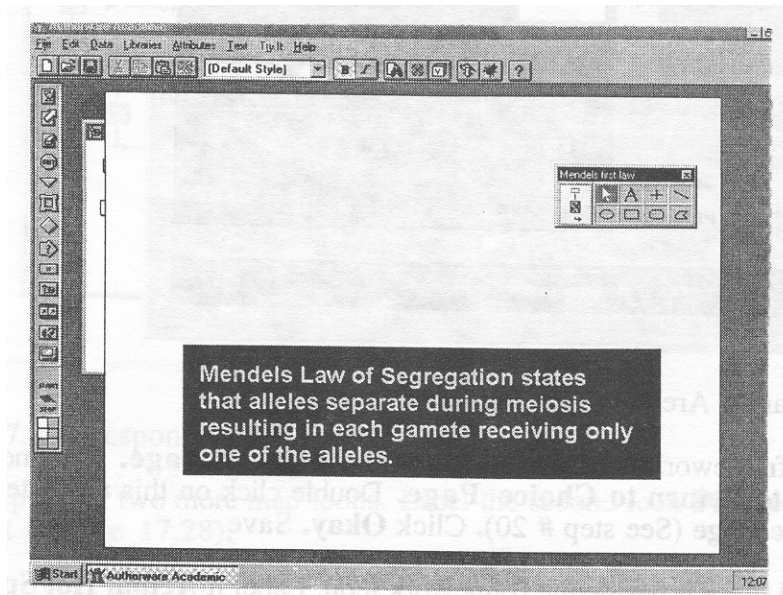
30. Double click on the framework icon labeled **Mendel hotspots page**. Rename **Return to Main Menu** button to **Return to Choice Page**. Double click on this navigate icon and set navigation to **Choice Page** (See step # 20). Click **Okay**. Save.
31. Drag a map icon and place it beside the framework icon. Label it **Actual Hot Spots**.
32. Open the map icon. Drag a display icon to the flow line. Label it **Hot Spot Instructions**.
33. Open the display icon and add text of your choice (Figure 17.30.). Close window. Save.



**Figure 17.30.** Hot Spot Instructions Display Screen

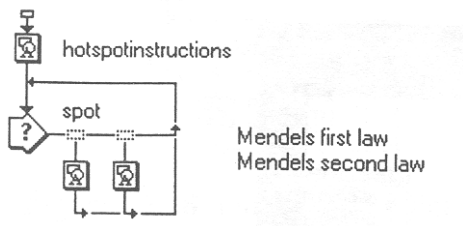
34. Drag an interaction icon to the flow line and place it below the **Hot Spot Instructions** display icon. Label it **Spot**.

35. Place a display icon beside the interaction icon. Choose response type - select **hot spot** (See Figure 17.27.). Label the display icon **Mendel's First Law**. Click on the display icon and type in the text of the law (Figure 17.31). In this example the text has been placed inside a box. Close window. Save.



**Figure 17.31.** Mendel's First Law Display Screen

36. Repeat step 34 for a second display icon labeled **Mendel's Second Law** (Figure 17.32.).

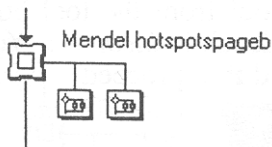


**Figure 17.32.** Flowline

37. Place the white flag above the display icon labeled **Hot Spot Instructions**. Run program by choosing **Restart from Flag** from the **Control** menu. Press **CONTROL** and **P** on the keyboard to pause the program. Resize and relocate dashed boxes to correct hot spot areas. Double click inside dashed box for **Mendel's First Law**. On the properties screen that appears: select - cursor type, change **Match** to **Cursor in Area**. Click **Okay**. Repeat for **Mendel's Second Law**. Proceed by pressing **CONTROL** and **P** on the keyboard. Check the interaction functions correctly

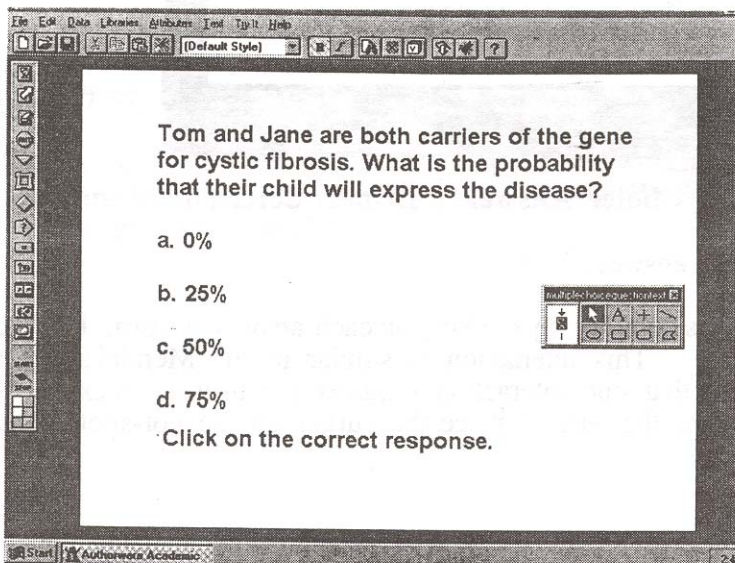
by placing the cursor over the text *Mendel's Law of Segregation*. The text of the law should immediately appear on the screen. Repeat for the second law.

38. Close **Actual Hot Spots** window by pressing **Control** and **J** on the keyboard.
39. Place a map icon beside the **Actual Hot Spots** map icon. Label it **Multiple Choice Question** (Figure 17.33.). Save.



**Figure 17.33.** Flowline

40. Open the map icon (**Multiple Choice Question**). Place a display icon on the flow line. Label it **Multiple Choice Question Text**.
41. Open this display icon and add the text of the multiple-choice question (including answers) (Figure 17.34.). Close window. Save.

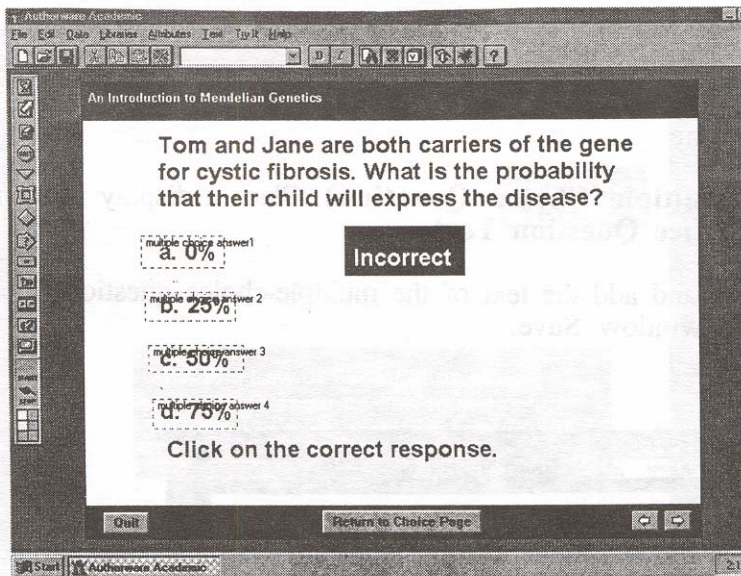


**Figure 17.34.** Multiple Choice Question Text Display Screen

42. Place an interaction icon on the flow line and label it **Question**.
43. Place a display icon beside the interaction icon. Choose response type (**hot spot**). Click **Okay**. Label this icon **Multiple Choice Answer 1**. Add three more display icons labeled **Multiple Choice Answer 2 - 4**.

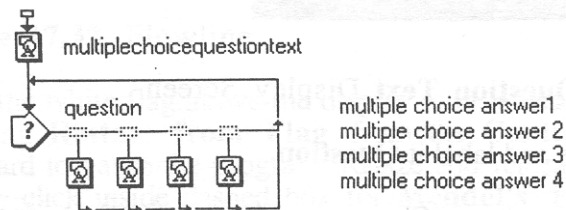


44. Place white flag above the display icon labeled **Multiple Choice Question Text**. Run program by choosing **Restart from Flag** from **Control** menu. Press **Control** and **P** on the keyboard. Resize each dashed box to enclose the appropriate answer. Double click on dashed box for **Multiple Choice Answer 1**. Set properties - change **Match** to **Single Click**, select cursor type. Repeat for each of the other three dashed boxes. Press **Control** and **P** to proceed.
45. Click on answer 1 in text. The program will stop. Select the text tool from the tool box and enter feedback to response (Figure 17.35). In this example the feedback is *incorrect*. You can add additional feedback information if you wish. Press **Control** and **P** to proceed.



**Figure 17.35. Multiple Choice Answer 1 Display Screen**

46. Repeat step 45 for each of the answers 2 - 4.
47. Check the interaction functions correctly by clicking on each answer in turn. The feedback text should appear on the screen. This interaction is similar to the Mendel's Laws hot spot interaction, the difference is that one interaction requires the user to click on the hotspot whereas the other just requires the user to place the cursor on the hot-spot. Close window (Figure 17.36). Save.

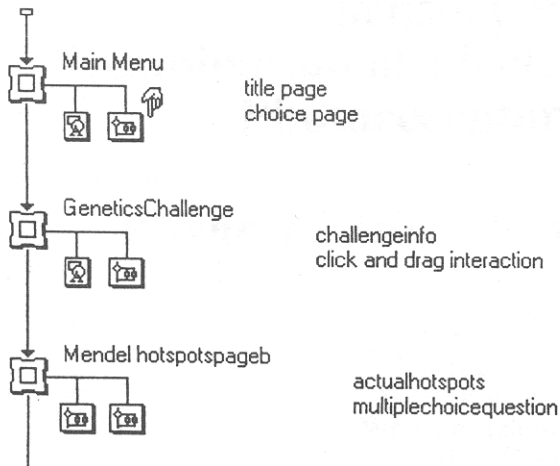


**Figure 17.36. Multiple Choice Question Flowline**

48. Return to **Choice Page** map icon on **Main Menu** framework. Open **Choice Page** icon. Double click on the **Genetics Terminology** navigate icon. Set navigation to **Challenge Info** (Figure 17.20.). Click **Okay**. Save.



49. Double click on the **Mendel's Laws** navigate icon. Set navigation to **Actual hot spots**. Click **Okay**. Close **Choice Page** window. Save.
50. The program is now complete. The entire flowline is shown in Figure 17.37.



**Figure 17.37.** Program Flowline

51. Depending on the version of *Authorware* that you are working with you can now proceed to package the finished program. From **File** menu choose **Package**. Follow screen instructions and choose the appropriate platform.