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Interactive stem cells: Education through game design

Sarah Hudson

INTERACTIVE STEM CELLS: EDUCATION THROUGH GAME DESIGN

Submitted by: Sarah Hudson

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ROCHESTER INSTITUTE OF TECHNOLOGY

Thesis submitted to the Faculty of the
College of Imaging Arts and Sciences
in candidacy for the degree of
Master of Fine Arts Computer Graphics Design

THESIS COMMITTEE APPROVAL:

CHIEF ADVISER: Associate Professor Chris Jackson, Computer Graphics Design

_____ _____
Signature of Chief Adviser Date

ASSOCIATE ADVISER: Assistant Professor Shaun Foster, Computer Graphics Design

_____ _____
Signature of Associate Adviser Date

ASSOCIATE ADVISER: Associate Professor Glen Hintz, Medical Illustration

_____ _____
Signature of Associate Adviser Date

School of Design Chairperson Approval:

CHAIRPERSON, SCHOOL OF DESIGN: Patti Lachance

_____ _____
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ABSTRACT

In my thesis I developed an interactive website intended to educate the non-scientific or lay public about stem cells. Most people have heard about stem cells but few truly understand them. It would be beneficial to those wishing to engage in the current stem cell debate to be more thoroughly educated. Currently, the information available is all geared towards scientists or from a biased source. I used a series of Flash games to convey the important information in an engaging way. The site is intuitive enough that even users unfamiliar with the Internet and basic high-school science knowledge will be able to navigate through it and access the information.

THESIS URL:
http://www.stemcelltastic.com

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1. INTRODUCTION

1.1 **PROBLEM STATEMENT**

I developed an interactive web site dedicated to educating the non-scientific public about stem cells. The goal of this site was to give its users the knowledge to make well-informed decisions or intelligently debate regarding stem cells. I used games to convey the significant information using a minimal amount of text in order to keep the user interested in the content. I wanted each game to be interesting enough on its own that it will be enticing even if the user has no interest in learning about stem cells.

I chose stem cells as the topic of my website because after researching the subject and speaking with a professional in the area, I became aware that while most people have heard about stem cells, few have any understanding of the different kinds and applications. I believed an interactive site using games is the best way to educate interested people about stem cells because it will hold their interest while providing the most relevant information.

The games are housed in a shell that resembles a science lab. As the user explores the lab, certain parts will bring up the games. Once in a game, if the user finishes any individual game they can either replay the game or return to the shell with the option of continuing on to the next game. The games are integrated and build upon each other with a goal in each leading to a final stage. I planned on building three of these games but included the option to expand and add more games.

1.2 **CONSTRAINTS:**

In order to keep my project manageable I placed a number of constraints on myself. While originally I intended to build five games I realized during the course of my research that this was an unrealistic estimate of my time; after a discussion with my advisors I came to the conclusion that I would be able to illustrate my solution to the above problem statement with three games.

I wanted my thesis to be available to a large audience and have users visit on their own so I chose a web-based project. This additionally meant that I had to be careful to keep the file sizes small and include a clear loader so the user never became confused or gave up before being able to experience my project. For that same reason I knew I needed to keep the interface itself simple and easy to use. While I knew I would have to include instructions, I wanted to be sure that if a user skipped reading them they could still find their way through my project.

As I had spent my time as a student learning both 2D and 3D software and design, I wanted to incorporate both into my project. This decision would add a design challenge to keep the two elements from diverging. I needed to be careful to consistently incorporate the two styles of graphics. In order to accomplish this I needed to keep the design language consistent throughout both the stage and the three games.

Stem cells research has been the focus of heavy debate. There are many (sometimes conflicting) points of argument to be sifted through, mostly centering around how researchers harvested the stem cells. Often the only method mentioned is harvesting

them from aborted fetuses while never referring to the possibility of harvesting stem cells from placenta or adults. This issue has the possibility to lead to a debate on abortion and would detract from the true subject matter of my project. Other times stem cells are talked about in reference to curing diseases and genetic disorders without mentioning how many pharmaceutical companies use them to develop and produce new drugs. I wanted to make sure this alternative, lesser acknowledged form of stem cell research is visited in my project.

Knowing that my subject matter is part of some heated debates I chose to avoid any political, ethical or religious issues. I simply wanted to present facts and not my personal opinion on stem cell research. I did not want my project to become anything other than a fun, learning experience.

1.3 **STEM CELL PRINCIPLES:**

- Embryonic stem cells have the potential to differentiate into any type of body cell.
- Adult stem cells can only differentiate into different types of specific body cells. For example, adult stem cells harvested from the eye can only differentiate into cones, rods, and other eye cells.
- Stem cells are currently used to produce pharmaceutical drugs. They are cultured and proteins are harvested from the cultures.

1.4 **TARGET AUDIENCE:**

- Both male and female
- Age 18+
- High school education or higher
- Users will have basic interest in learning about stem cells, but need not have any knowledge

1.5 **TECHNICAL SPECIFICATIONS**

Software used:

- Adobe Flash CS4, ActionScript 3.0
- Adobe Illustrator CS4
- Maya 9, Maya 10

Platform:

- Web based for both Mac and PC computers

2. SURVEY OF LITERATURE

2.1 **SUMMARY:**

Based on my sources I believed my project to be viable as long as I was careful what stem cell information to use. Given the level of information I plan on employing, I had more sources dealing with stem cells than I required. I needed to avoid anything too clinical while including all the information necessary for basic understanding of the subject matter. As for the Flash games themselves I believed these sources would provide more than enough examples to develop my own set of games. After studying current games I have come to understand that it is important for each of the games included in my thesis to tie back into the main menu system and each other to create a cohesive whole. I needed to reuse design elements in each rather than creating an entire new design scheme for each game.

3. PROCESS

3.1 **INTRODUCTION:**

3.1.1 Research:

I began my process by researching both the content I wanted to use as well as the method that I would use to convey that content. Because I had chosen games as the medium for teaching users about stem cells I searched for existing educational games that I felt were successful and fun. I managed to discover quite a few of these sites that were mainly educational as well as online Flash games that were merely entertaining. Studying both these types of games helped me to shape the types of interactions and feedback I wanted to use in my own project.

QuakeQuizSF is an online interactive instructional website educating residents of San Francisco on earthquake safety. Humor and amusing animations are used to make the serious subject matter more enjoyable. This site helps my thesis by demonstrating how other serious subject matter can be delivered in a light-hearted manner while not diminishing from the content.

Got Milk? is an online interactive immersive website that uses games to teach users about the health benefits of milk. The site uses simple 2D elements and 3D renderings together to create an environment in which the games are located, each one fitting in seamlessly with each other. This site illustrates a more cohesive experience I would like to emulate in my thesis project.

Simple Machines is another educational game teaching the physics of simple machines using several small games. They use cute little characters to guide you through the exercises which I found to be an effective way of leading the user through the site.

My next step was to research the content I would need in my site. After reading a number of scientific texts it became clear that there was simply too much information for me to pick out the important points. I then turned to Kathryn Golden, the biochemical engineer who first gave me the idea for my thesis. She was able to guide my research towards the three points of information I used to design the games: embryonic stem cells, adult stem cells, and one of the applications of stem cell research, the creation of new pharmaceutical drugs.

Now that I had my content and knowledge of other successful educational games I broke my project up into three main parts: the 3D background elements, the stage, and the games.

3.2 **3D ELEMENTS:**

Knowing that this part of my project had the potential to take weeks of rendering I decided to begin here. I planned to have the 3D elements completed and rendering while I worked on the Flash and 2D graphics.

From my research of other educational online games I knew I wanted to give my project a light-hearted and friendly feel. I chose not to model my 3D elements completely realistically because one of the underlying principles I tried to keep constant was the lighthearted nature of delivery while working with such serious

content. I decided to do so by the use of cartoon style graphics and bright colors. For these 3D elements I began modeling the containers and the substance within them and testing out various combinations of shaders to get this desired effect.

I began with a very cluttered, colorful environment complete with a highly textured background but it soon became apparent that this detracted from the real content of my projects. I proceeded to run through various options, varying both the background and the objects themselves until I found the right combination.

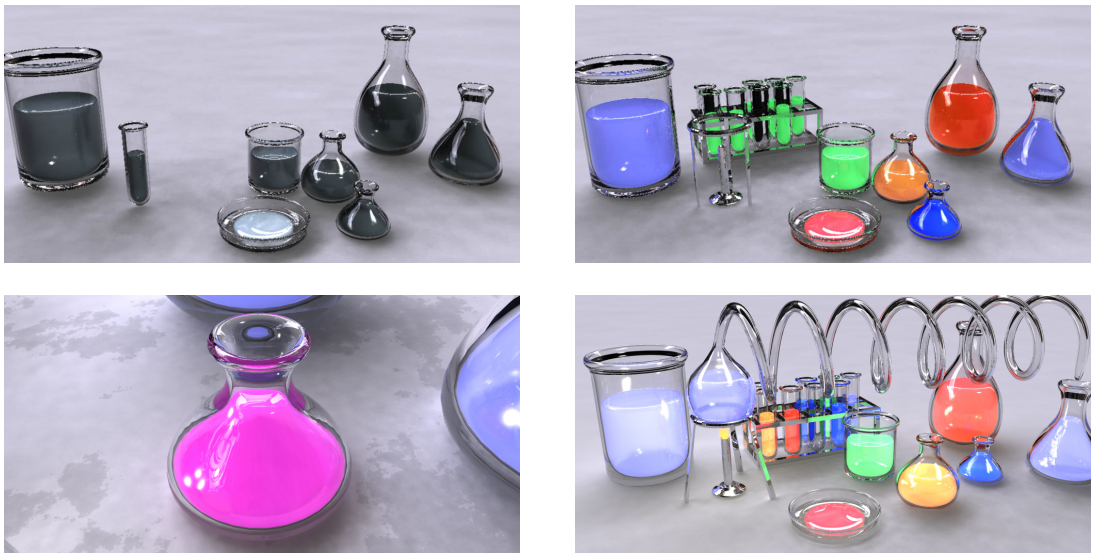


Figure 3.2.1 *Rendering iterations.*

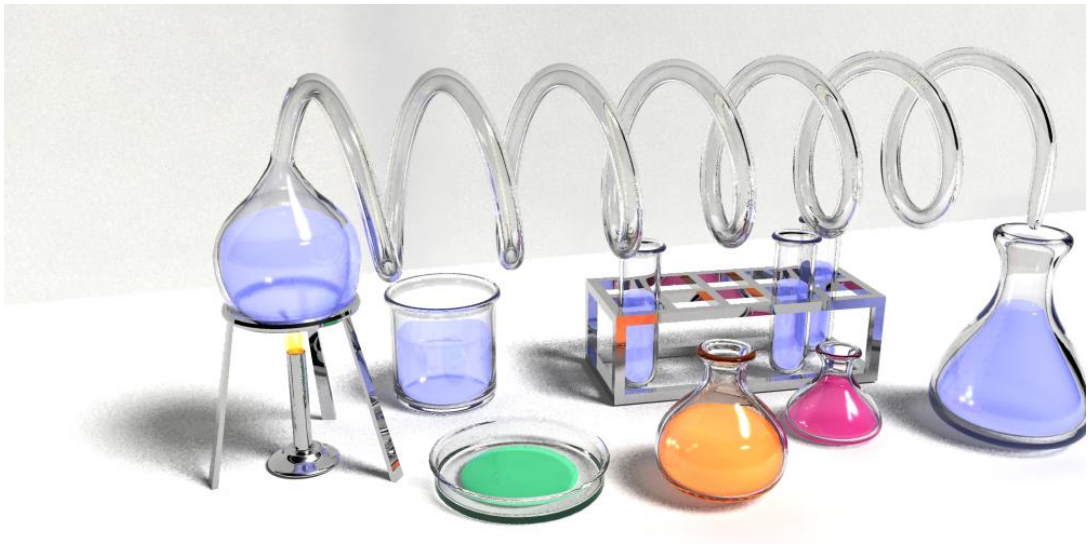


Figure 3.2.2 *Final stage rendering.*

It quickly became clear that the rendering would take much longer than expected. To solve this problem I first attempted several quicker but lower quality methods of rendering, removing the environment map, global illumination, final gathering and reducing the number of ray tracing iterations. Unfortunately I was not happy with this output. After a series of test renders I managed to cut my render time down by approximately 20% by removing the environment map and global illumination but

the layers of glass were unsatisfactory without final gathering and a high number of iterations for ray tracing.

I knew I needed a new solution for my extended render time that wasn't dependent on available computers in the Computer Graphics Design lab. Luckily I was able to use the render farm and while this still required constant checking and resubmitting files I was not dependent on a limited number of free computers in the lab and was able to check and update the status of my render jobs remotely.

3.3 **STAGE:**

My biggest challenge while designing the stage was keeping it simple but user-friendly. Initially, my plan was to use lots of color throughout but it quickly became confusing. In the end only the actual clickable games are brightly colored while keeping a more subdued grey to pewter color palette for the rest of the stage.

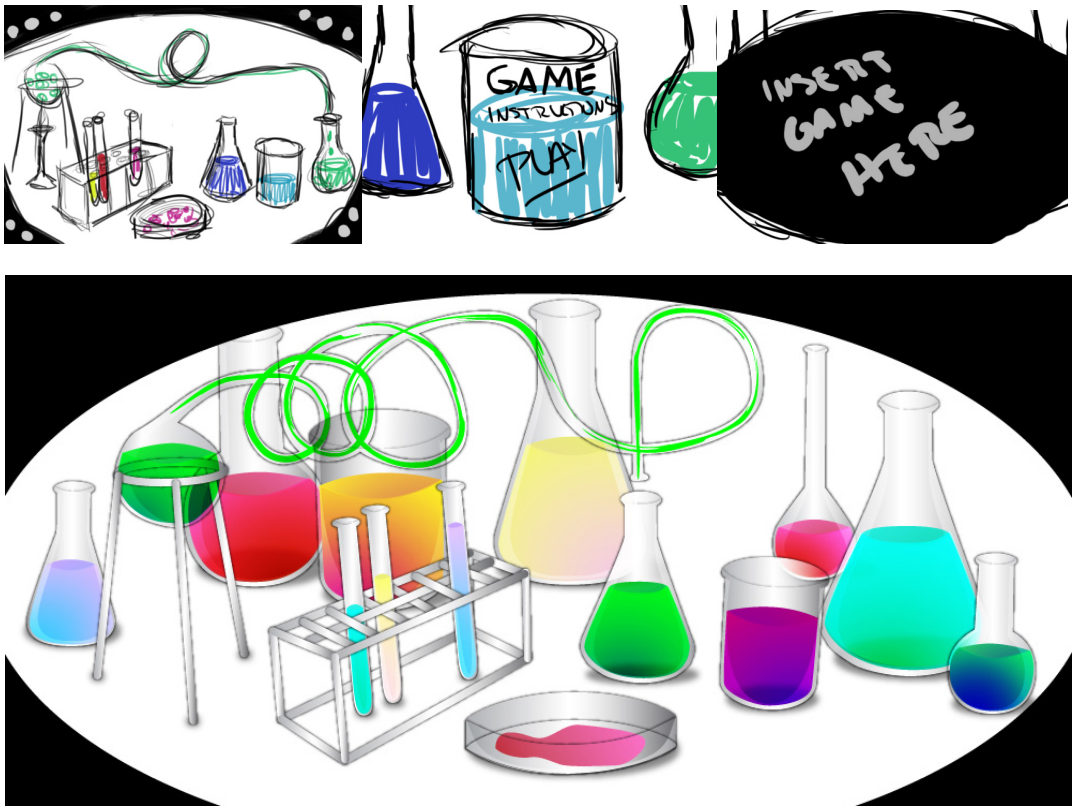


Figure 3.3.1 *Early stage concepts.*

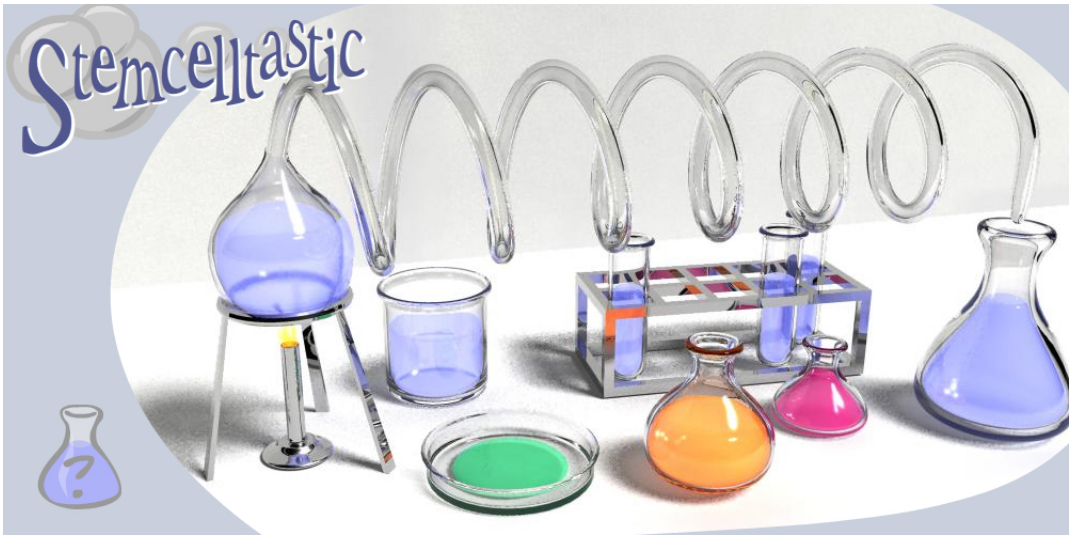


Figure 3.3.2 *Final stage design.*

In my early concept the border was both symmetrical and black which I felt detracted from the lighthearted feeling I wanted to convey as in figure 3.3.1 above. At this point I realized I needed to develop a simple color palate I could use throughout my project that would not detract from the main active elements, the buttons leading to the games. I chose subdued blue/grey colors that allowed the active game links to pop and immediately draw the user's attention.

The border around the rendering initially was different for the stage and each game but as I worked with my design I realized I needed more consistency throughout my project. I ended up keeping the border the same which allowed me to keep the help icon in the same place for the stage and each game.

Figure 3.3.3 Initial welcome screen.

When first launching my project you are greeted with the above welcome screen. The avatar provides a friendly means of conveying the instructions that are used throughout the stage and games. Here on the stage he simply informs the user that

to start they must click on the green petri dish which represents the first game and that the other games will be unlocked after completing the ones that come before.

After clicking on one of the brightly colored dish or beakers the camera zooms in on that item and provides a brief introduction to the game that will launch should the user click. The animation that zooms into the selected object represents the bulk of my rendering time.

3.4 GAMES:

At first each of these games were going to be developed using only 2D, vector graphics in flash but after attempting to build them this way it became apparent that something needed to be changed to connect them to the main stage. I decided to model the background graphics (those the user was not expected to directly interact with) in Maya using the same rendering methods as the stage.

The first set of games I designed were each based off existing games. I attempted to mold recognizable games such as Pong to fit my content. The pong-like game would demonstrate how retroviruses are used to mutate adult stem cells to induced pluriopotent stem cells which act much like embryonic stem cells. A second game was based off of Asteroids. The user controlled a ship that they flew through the body searching out areas where adult stem cells could be harvested. A third game turned out to be more of a simulation where the user manipulated the stem cells to produce cultures.

Because these games were based on such different interactions it was impossible to form a narrative to connect them. They each worked by themselves but failed to come together as a whole. I needed to take a step back and reevaluate my goal. While these games were proven to be entertaining they could not help me succeed in my goal of providing information.

For my next attempt at designing the games I chose to start from scratch. Instead of building on existing game-types I decided to start with the information I was trying to convey. Keeping this in mind I was able to develop the three games that I will discuss in depth later on in sections 3.4.1 to 3.4.3.

In general I ran into some issues regarding the instructions at the beginning of each game. It took many iterations before I found the best balance between simplicity and providing enough information to understand the topic and gameplay. I wanted to keep text to a minimum so I limited my first attempt at providing instructions to a few brief sentences. Even for the first, simplest game this did not provide a relevant amount of information. I could convey how to play the game but not why the user was playing nor what information I wanted to user to come away from the game with.

My next attempt only added more text. In order to provide all the necessary information the text now took up several frames and required the user to navigate through manually using the same navigational arrows as on the stage help bubble. This proved to be awkward and unwieldy. After discussion with my advisors I came to the conclusion that there needed to be a visual element to the instructions and automatic navigation.

The final navigation includes an animation showing the user exactly what the game play will be like simulating the gamplay. The text changes automatically, following this animation explaining both the gameplay and the information behind it. There is also a brief, visual glossary defining all of the active elements the user will be required to interact with during the game. This combination of introduction and explanation is kept consistent throughout the three games.

After the user successfully completes all three levels the avatar returns, reiterating what they have just learned, offering a chance to replay the game or bringing the user back to the stage so they can continue on to the second game. Should they fail the game they are informed they failed to learn the intended information while presenting the information again. Originally I intended that the user would not be able to move on to the next level without beating the previous game but after receiving some frustrated user feedback I decided to change it. Now the user simply must play the game, they do not need to win to move forward.

3.4.1 Game 1

The goal of the first game was to provide information about embryonic stem cells, specifically how they have the potential to differentiate into any type of body cell. In order to do so I designed a game where the user was required to heal damage to various organs using embryonic stem cells.

The user is presented with a rendered image of the human body with organs showing damage. To heal the damage the user must drag one of the embryonic stem cells onto the specifically damaged area in a certain amount of time. If they successfully complete this task once they move to the next level where the damage moves, becomes smaller and the time they have decreases.

While searching for the damage they can use the arrow keys to pan the body around, z to zoom in and x to zoom out. If they release an embryonic stem cell over an area that is not damaged it will remain there until they click on it again.

Figure 3.4.1.1 *Entrance to the first game.*

Figure 3.4.1.2 *Game welcome and instructions.*

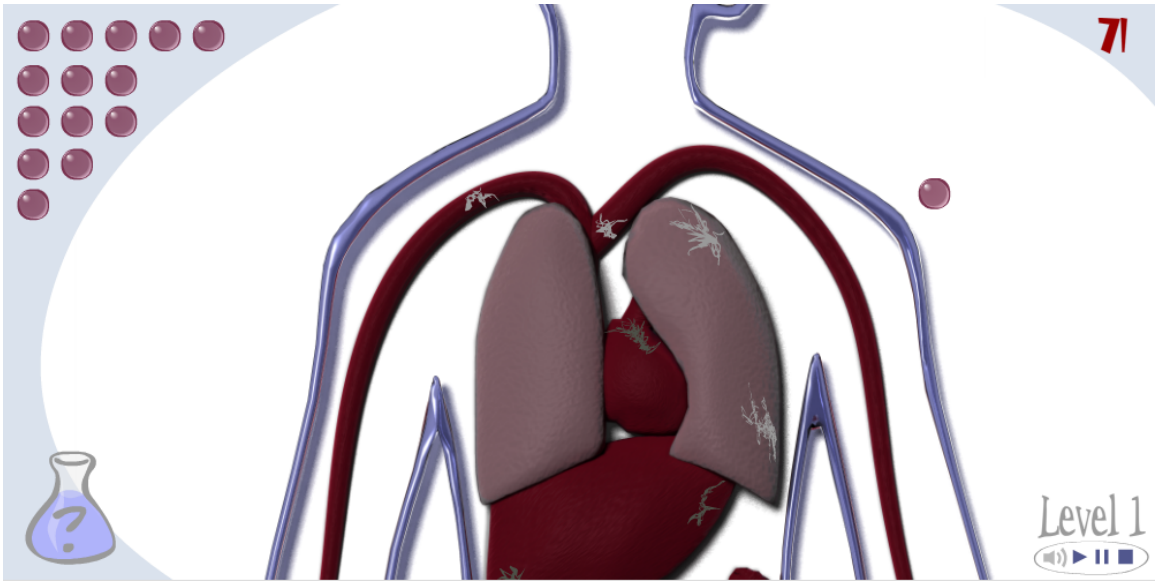


Figure 3.4.1.3 *Gameplay.*

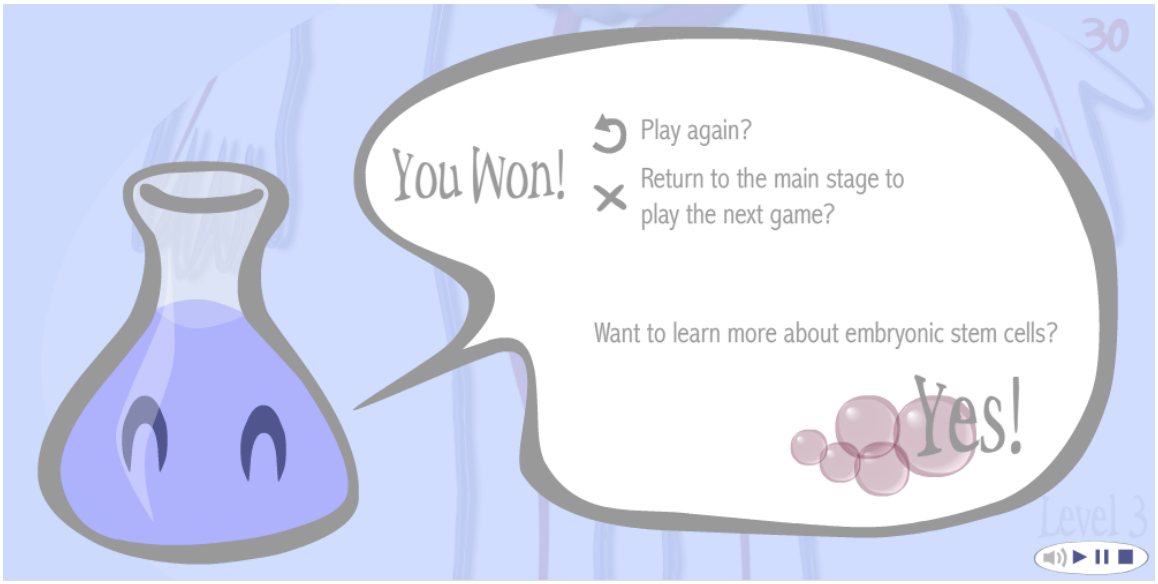


Figure 3.4.1.4 *Completion screen.*

3.4.2 Game 2

The goal of the second game was similar to the first, providing information about adult stem cells so I wanted to keep the game play similar. In this game the user is provided with several types of adult stem cells along with a few embryonic stem cells and is required to heal a different set of damage. The adult stem cells will only heal the organs they represent while the embryonic stem cells will still heal any damage.

The gameplay is basically the same to the first game with an added level of complexity. Instead of only having embryonic stem cells the user now must remember that they also have adult stem cells. Because adult stem cells can only differentiate into the type of cell from which they were harvested the adult stem cells in the second game will only heal damage in organs they represent.

Figure 3.4.2.1 *Entrance to the second game.*

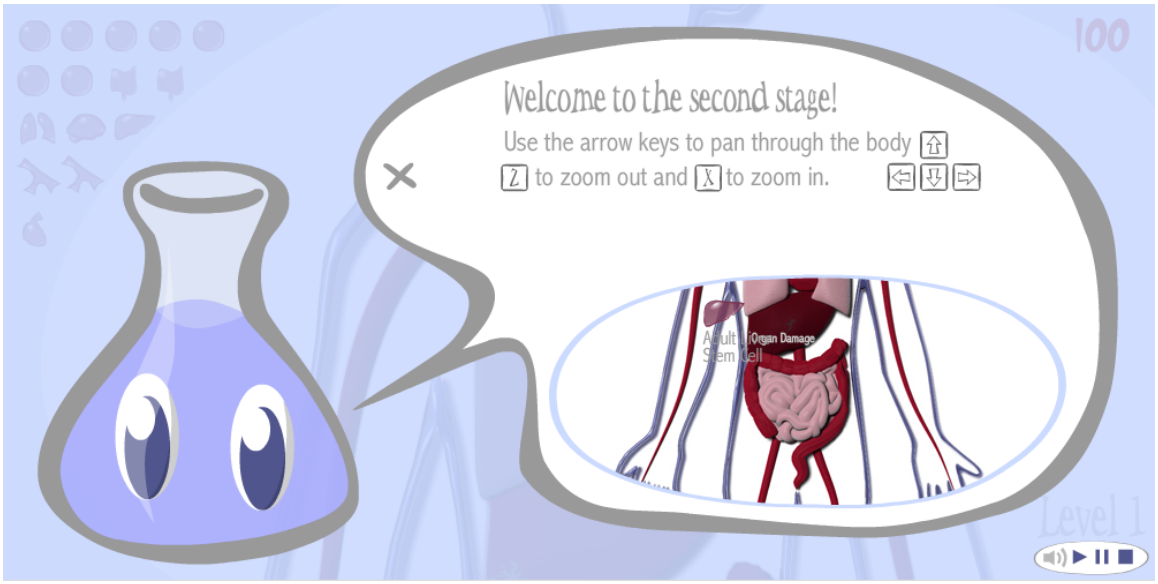


Figure 3.4.2.2 *Game welcome and instructions.*

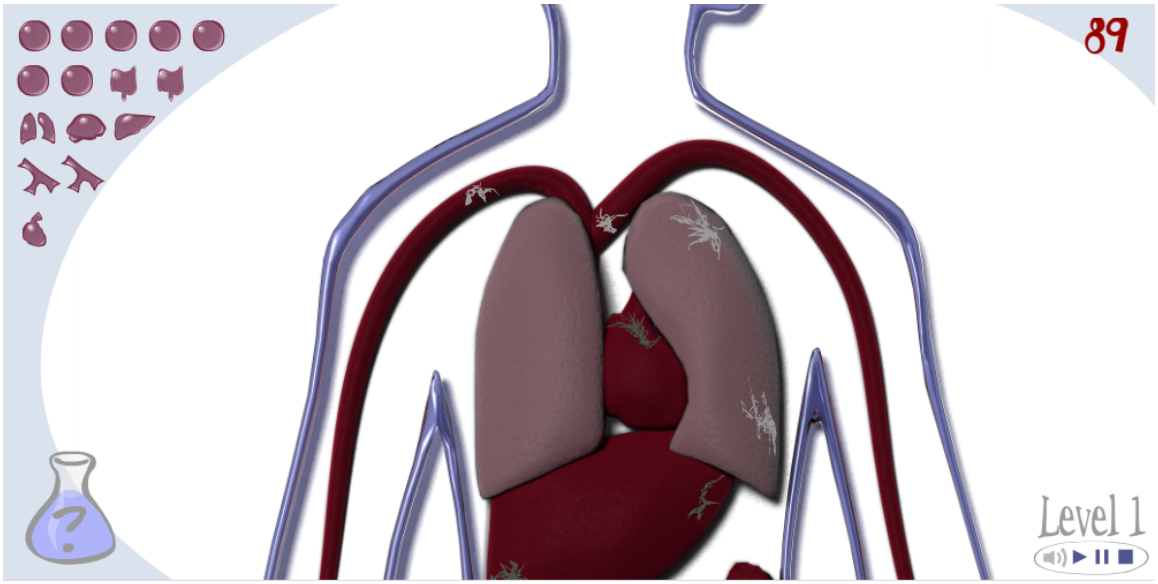


Figure 3.4.2.3 *Gameplay*.

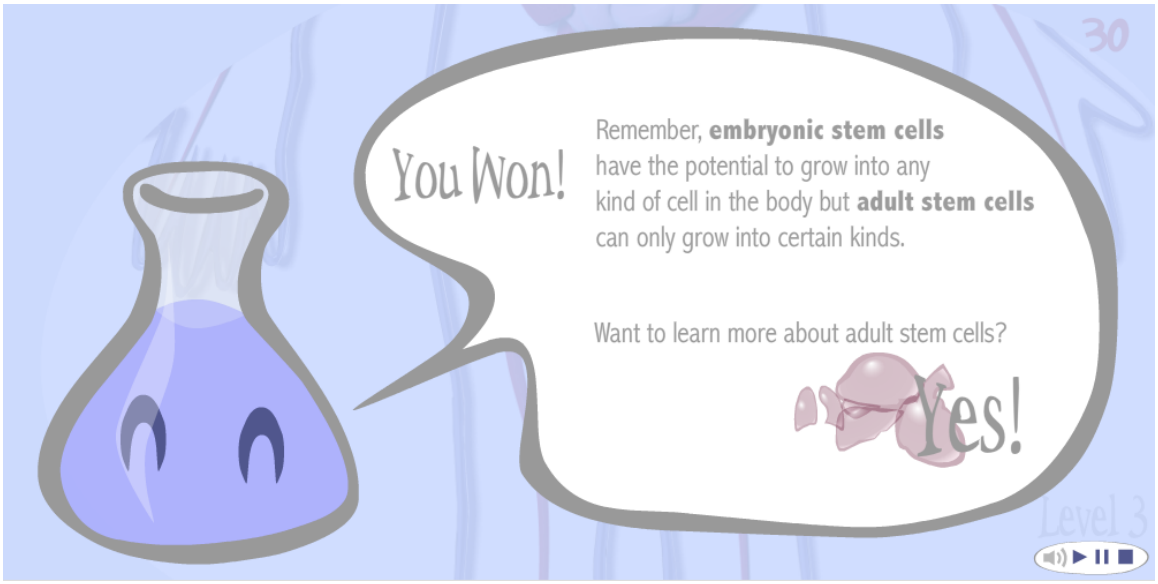


Figure 3.4.2.4 *Completion screen.*

3.4.3 Game 3

The third game provided me with the biggest challenge. At first I wanted to stay consistent and continue building on the first two but the information I was trying to convey did not lend itself to a game designed in the same way. After speaking to Kathryn Hufford, I wanted to address one of her biggest concerns, the fact that stem cells are used to develop new pharmaceutical drugs.

The basic stem cell concepts behind this game are more complicated as well. The user is introduced to the concept that embryonic stem cells will produce larger cultures than adult stem cells during the first half of the game. During the second half they use substances harvested from those cultures to try to find the formula for a new pharmaceutical drug.

Because of this game's complexity I broke it up into two parts. In the first part the user is given a set of embryonic and adult stem cells and they choose which ones to culture. The user drags the stem cells to the petri dishes and can watch as they multiply. The beakers along the right side of the screen automatically represent the compound harvested from the stem cells.

In the second half the user drops these compounds into test tubes, trying to figure out the correct combination. After each test tube is filled the user receives feedback as to which guess was correct and which was incorrect. If they are able to figure out the solution within five guesses they win the level but if they do not or if they run out of compounds they are forced to try again. The solution will remain the same until they figure it out so they can build on the work they did previously.

Figure 3.4.3.1 *Entrance to the third game.*

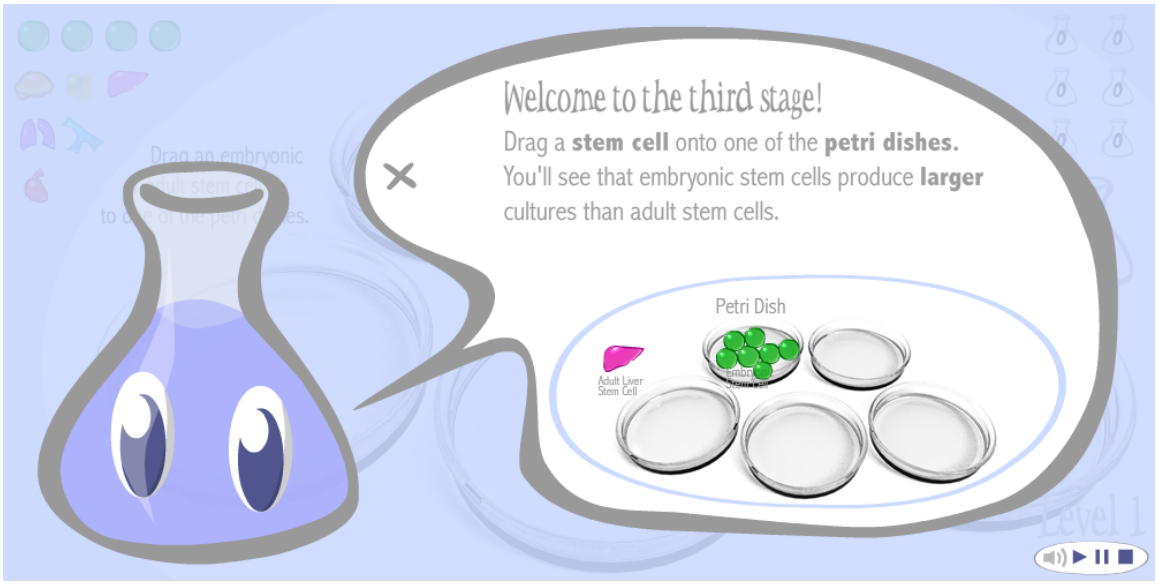


Figure 3.4.3.2 *Game welcome and instructions.*

Figure 3.4.3.3 *Gameplay*.

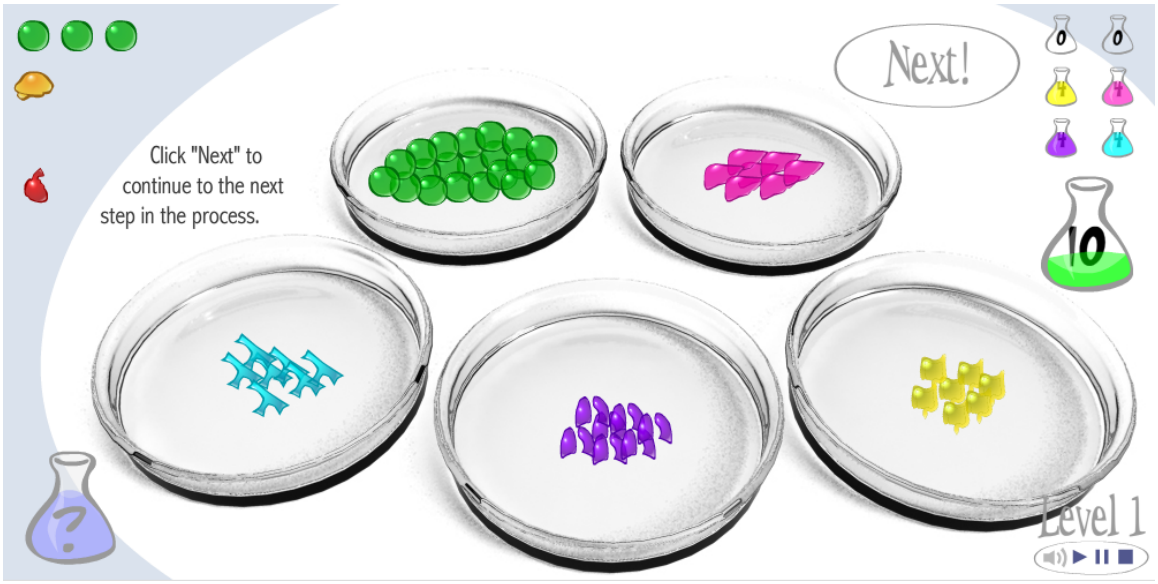


Figure 3.4.3.4 *Because of the complexity of the third game it was broken up into two parts.*

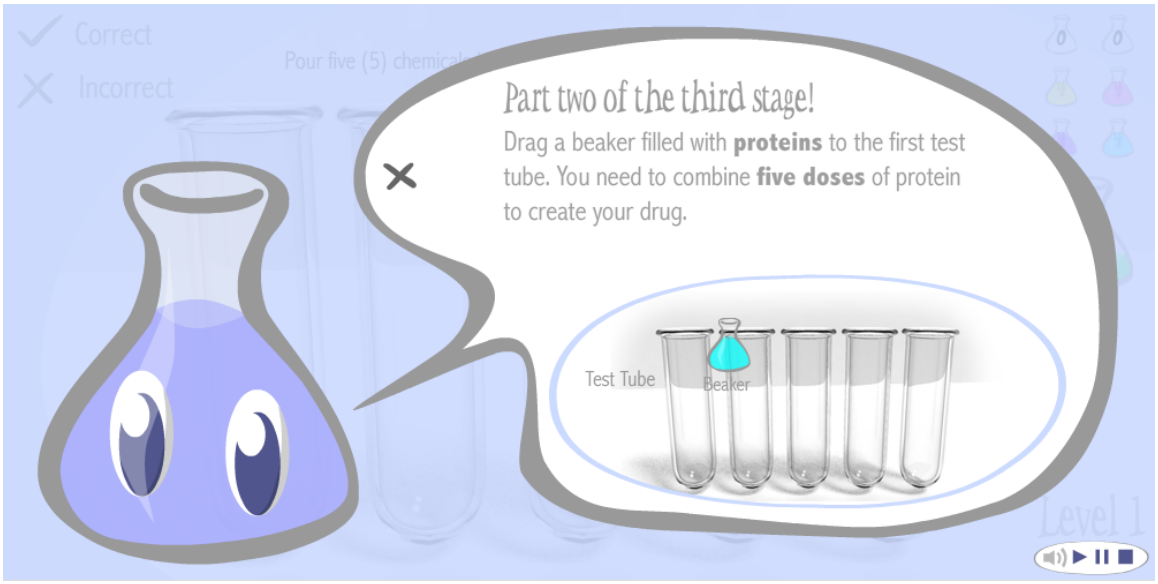


Figure 3.4.3.5 *Instructions to the second part.*

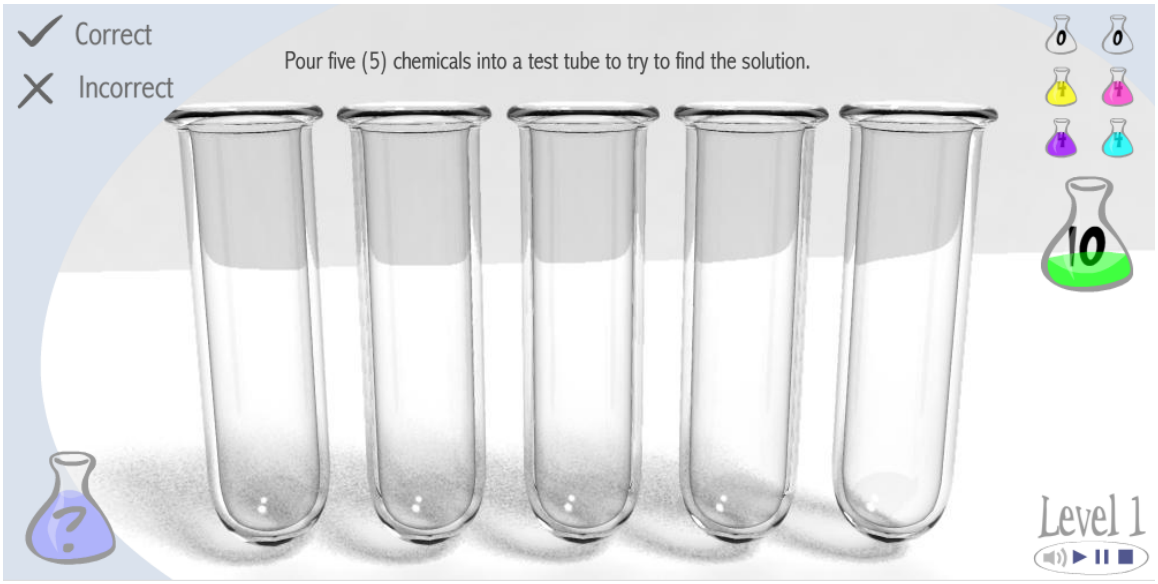


Figure 3.4.3.6 *Gameplay*.

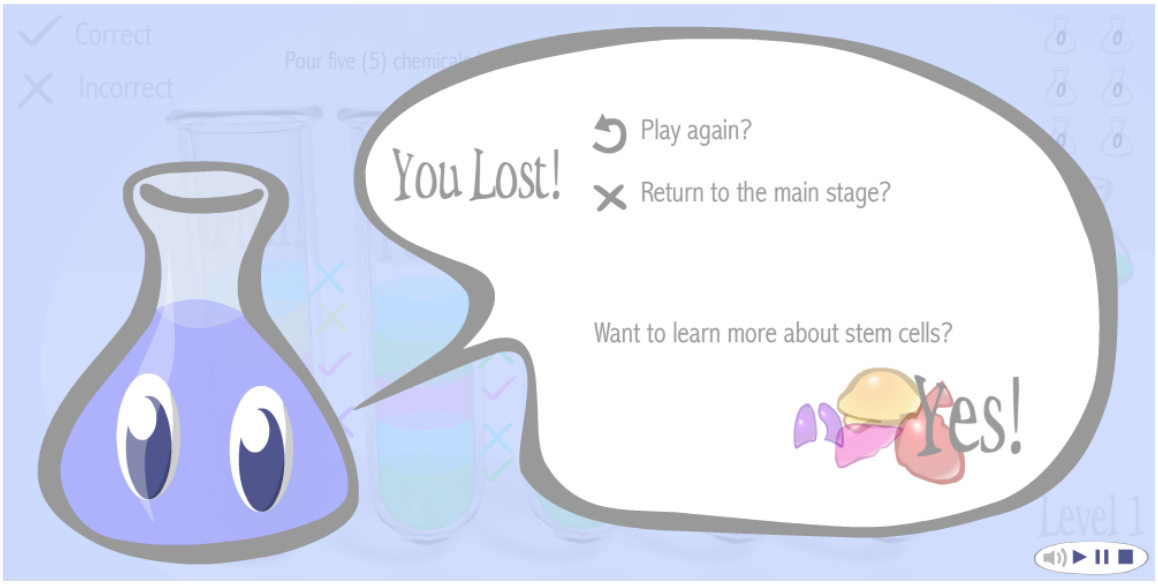


Figure 3.4.3.7 *Completion screen.*

4. SUMMARY

4.1 **AUDIENCE FEEDBACK:**

I gained user feedback through an emailed survey and the thesis show. The email survey asked a few usability-centric questions about the general navigation, the games themselves and also included a few general questions:

NAVIGATION:

- Could you find your way around pretty easyily?
- Were the buttons obvious enough?
- Did you ever get lost?
- Did you ever get confused?
- Do you have any suggestions?

THE GAMES:

- Could you figure out how to play?
- Were they winnable?
- Do you have any suggestions?

GENERAL QUESTIONS:

- What was your favorite part?
- What was your least favorite part?
- Was anything awkward?
- Did it take too long to load?
- Feel free to give any general critique.

The answers I received to this survey helped me streamline my design. While most people answered that they could easily find their way around a few who were less familiar with flash games became lost. Because of this I added and made sure the written and illustrated instructions were clear.

This survey also helped me realize that the third game was both too complex and too confusing. These answers led me to split it up into two parts and expand the instructions to be much more precise, adding written cues and feedback for the user as they play the game.

I was gratified to find out that many people's favorite part of my project was the 3D animation as I was afraid that would get lost next to the gameplay. Several of my responses admitted to enjoying the zoom animation the most.

During the thesis show I was able to observe a wide range of users using my website. On the technical side the site performed as expected with no crashes or surprises. Each user was able to begin at the first game and work their way through to the third. As opposed to having each user fill out a survey and examining the answer afterwards I found it more useful to speak directly with the users.

I was gratified to learn that they did come away from my project knowing more about stem cells than when they began. They also communicated their enjoyment of the games themselves apart from the learning experience of the project.

5. CONCLUSION

I have gained a much more thorough understanding of both the technical and design sides of Computer Graphics Design having completed this project. I was able to develop my sense of design, my typographic skills, and my knowledge of the programs I used while creating my project. I learned the value of consistency while creating large projects and sites both with regard to the designer and the end user. It is easy for both to become lost if the project does not follow a set of self-imposed rules. On the technical side I was faced with and overcame many potentially show-stopping problems both in Flash and Maya. I now have a much broader base of ActionScript to draw upon and a deeper understanding of rendering efficiently in Maya.

While I am happy with the final project I plan on revisiting the first game in an attempt to differentiate it a little more from the second game. I believe that this is also a starting place. As stated in my proposal I intended this to be a prototype of a potentially larger project and after completing the current three games I believe there is room for growth, to add more games that can expand that knowledge conveyed in my project. Because of the constraints I placed on this project I was forced to limit the amount of information I could work with. There is a wealth of knowledge about stem cells out there and I would like to be able to include more of it.

I never completely solved my rendering problem although I did find a workable solution that produced the content I needed. I plan on further researching rendering techniques to try to decrease my render times so when I do add more games it will not take weeks to render the animation and stage frames.

In conclusion, I believe I succeeded in my goal of creating an educational flash website that successfully taught users about stem cells. While observing users first hand during the thesis show it was clear that they were enjoying themselves while taking in the material presented. The games were interesting enough that users often replayed them even after winning.

6.1 **THESIS PROPOSAL:**

Thesis Proposal for the Master of Fine Arts Degree

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

Interactive Stem Cells: Education through Game Design
Submitted by: Sarah Hudson
November 16, 2009

Thesis Committee Approval:

Chief Adviser: Associate Professor Chris Jackson, Computer Graphics Design

_____ _____
Signature of Chief Adviser Date

Associate Adviser: Visiting Assistant Professor Shaun Foster, Computer Graphics Design

_____ _____
Signature of Associate Adviser Date

Associate Adviser: Associate Professor Glen Hintz, Medical Illustration

_____ _____
Signature of Associate Adviser Date

School of Design Chairperson Approval:

Chairperson, School of Design: Patti Lachance

_____ _____
Signature of Chairperson Date

Abstract

In my thesis I will develop an interactive website intended to educate the non-scientific public about stem cells. Most people have heard about stem cells but few truly understand them. It would be beneficial to those wishing to engage in the current stem cell debate to be more thoroughly educated. Currently, the information available is all geared towards scientists or from a biased source. I will use a series of Flash games to convey the important information in an engaging way. The site will be intuitive enough that even users unfamiliar with the Internet and with basic high-school science knowledge will be able to navigate through it and access the information.

Problem Statement

I plan to develop an interactive web site dedicated to educating the non-scientific public about stem cells. The goal of this site is to give its users the knowledge to make well-informed decisions or intelligently debate when it comes to stem cells. I will use games to convey the significant information using a minimal amount of text in order to keep the user interested in the content. I want each game to be interesting enough on its own that they will be playable even if the user has no interest in learning about stem cells.

I chose stem cells as the topic of my website because after researching the subject and speaking with a professional in the area I have become aware that while most people have heard about stem cells few have any understanding of the different kinds and applications. I believe an interactive site using games is the best way to educate interested people about stem cells because it will hold their interest and only provide the most relevant information.

The games will be housed in a shell that resembles a science lab. As the user explores the lab certain parts will bring up the games. Once in a game, if the user finishes any individual game they will have the option to either return to the shell or continue on to the next game. The games will be integrated and build upon each other with a goal in each leading to a final stage. I plan on building three to five of these games but include the option to expand and add more games.

Target Audience:

- Both male and female
- Age 18+
- High school education or higher
- Users will have basic interest in learning about stem cells but need not have any knowledge

Personas:

Jeremy is a 29 year old man who is concerned about an upcoming vote concerning stem cell research. He has a great deal of experience with computers and the internet, one of his favorite past times is online gaming. He is very technical and capable of digesting dense scientific text but is very busy with his professional life and rarely finds the time for all the reading he wishes to do.

He would be eager to find a site that explained stem cells to him but might quickly become bored with the simple games. He would make his way through the site rapidly, gather the information he was looking for and probably never return.

Sheri is a stay at home mom with limited internet experience. She has watched her children play games on the web and while they interest her she hasn't found one she feels comfortable using. Sheri has often heard about stem cell research but no one seems to ever explain what they are.

Finding the site, she would take some time figuring out how to navigate it but once she does she will replay the games. After a while the information will become secondary because she has already learned it but the real draw for her is the entertainment.

Survey of Literature

I plan to develop an educational flash website to teach the non-scientific populace about stem cells in an interesting and engaging way using games to introduce the content in small, manageable sections. My original starting point was Kathryn Golden, a biochemical engineer who suggested stem cells would be interesting subject matter for an interactive website. I began looking for other sources both in the Wallace Library and the Internet. I knew I wanted a mixture of material on stem cells, Flash CS4, ActionScript 3.0, and digital learning as well as examples of existing Flash games.

Stem Cells

Kathryn Golden, personal interview

> Kathryn Golden works for Percivia, a biochemical company that develops products to combat disease using a human stem cell line. She has expressed interest in new ways to help introduce people to stem cells that make the subject matter easier to absorb. Her input will help give more specific direction to my thesis project and help me narrow down the most important parts that need addressing.

University of Wisconsin Stem Cell & Regenerative Medicine Center
University of Wisconsin-Madison
9/21/2009
http://www.stemcells.wisc.edu/

> This site contains links to recent stem cell research and potential contacts for more primary sources and is intended for professionals. It will be helpful if my primary source, Kathryn Golden, cannot provide enough information or if I decide to include some of the more current research in my project. They also have a database of stem cell photography I believe I can get permission to use since my thesis is not for profit.

Stem Cell Information
The National Institute of Health
9/21/2009
http://stemcells.nih.gov

> *The National Institute of Heath's* stem cell website contains all of the basic information about stem cells including information on the government's policy toward stem cells. The site is meant for the general public. It includes clearly outlined sections creating clear differentiations between segments of the information that can be translated into games in my project.

Adult Stem Cells
Edited by Kursad Turksen
Humana Press, 2004

> *Adult Stem Cells* is a collection of papers, each going into depth on a different type of adult stem cell aimed at scientists and researchers. The later papers are broader topics on uses and research of adult stem cells. These papers seem too clinical to be of much use in my project but topics themselves give a good overview on the types of adult stem cells found in the human body.

Human Embryonic Stem Cells
Edited by Arlene Y. Chiu and Mahendra S. Rao
Humana Press, 2003

Human Embryonic Stem Cells is a collection of papers on the subject that detail the development and different possible applications also aimed at scientists and researchers. It goes into more depth than I will need but the first few papers will be helpful in getting the basic information. The first few papers contain the more general information I can use while the later chapters become too specific to be viable sources for my thesis.

Stem Cell Biology
Edited by Daniel R. Marshak, Richard L. Gardner, and David Gottlieb
Cold Spring Harbor Laboratory Press, 2001

Stem Cell Biology is a collection of papers on specific aspects of stem cell biology. The papers concentrate mostly on adult stem cells and manipulating them with a few chapters on specific kinds. These also are mostly too specific for my project.

Stem Cell Now
Christopher Thomas Scott
Pi Press, 2006

Stem Cell Now goes into the history behind the discovery of stem cells before delving into current research and the stem cell's role in human development and is intended for the general audience. The history is very interesting and I believe it will be important to include at least as background information.

The Extreme Future
James Canton, Ph.D.
Penguin Group, 2006

Dr. Canton runs the Institute for Global Futures, a think-tank dedicated to predicting important trends based on current research and spending. Part of his book details how stem cells will soon be an important medical tool. He explains how it is important that we prepare for this by learning all we can about them now.

Games in Education

Computer-Based Instruction: Methods and Development
Stephen M. Alessi and Stanley R. Trollip
Prentice-Hall 1985

Computer-Based Instruction is an early book demonstrating the uses of computers in education. It takes a broad view, starting with the actual hardware before moving on to software and programming. Unfortunately, I believe there is little information in it that will help with my thesis as the book is outdated.

Digital Game-Based Learning
Mark Prensky
McGraw-Hill, 2001

Digital Game-Based Learning describes the importance of moving away from traditional forms of training in order to hold the attention of the new generation of

professionals. The author describes the importance and benefit of having fun while learning and details several successful examples of using game-based learning. The book is geared toward bringing game-based learning to corporations but I believe the ideas presented within are applicable to my thesis as well.

E-Learning Games: Interactive Learning Strategies for Digital Delivery
Kathleen M. Iverson
Pearson/Prentice Hall, 2005

E-Learning Games is more of an instruction manual describing specific aspects of instructional multimedia. Most of the book gives outlines of different interactive games to aid in education. Each of these is very specific and I believe these outlines will help me develop games for my thesis.

Games and Simulations in Science Education
H. I. Ellington, E. Addinall, and F. Percival
Nichols Publishing Company, 1981

Games and Simulations provides both descriptions of various kinds of games used in education as well as details how each different kind helps in the teaching process. This book also contains a list of games available in 1981. While this book is possibly outdated I believe it contains basic information that is still true today which will help me choose the best kinds of games to help with teaching my subject matter.

Challenges for Game Designers
Brenda Brathwaite and Ian Schreiber
Cengage Learning, 2009

Challenges for Game Designers is written for video game designers but gives them tangible exercises based in different aspects of game design. This book focuses on getting developers away from the computer when they hit a block and brainstorming methods so I'm not sure if it will be very helpful.

Flash

Flash CS4 Professional Bible
Robert Reinhardt and Snow Dowd
John Wiley & Sons, 2009

Flash CS4 Professional Bible describes the newest version of Flash and includes many tutorials on its use and is aimed at proficient Flash users. It is a very thorough book going into every aspect of Flash CS4 and will help me get a better understanding of Flash CS4.

Foundation Flash CS4 for Designers
Tom Green and David Stiller
Friends of Ed, 2009

Flash CS4 for Designers is another tutorial-based book specializing more in animation and different aspects of Flash rather than on ActionScript. It assumes the reader has very little knowledge of Flash. Most of this book is review but the chapters on CSS and XML will be helpful while building my thesis. It also includes parts on the new 3D engine which could be useful in building the games.

Foundation Game Design with Flash
Rex van der Spuy
Friends of Ed, 2009

Game Design with Flash teaches the reader how to build many basic kinds of games in Flash using ActionScript 3.0. It describes important aspects of Flash games including how to build a better enemy AI, collision detection and physics. It gives examples of different types of Flash games and interactions I will be able to use while developing my thesis.

Games

The Adventures of Tinger
9/21/2009
http://adventuresoftinger.com/

Adventures of Tinger is a flash platform game. The game is only one level but has many small aspects that make that one level replayable. It is not an educational game but it does show that it is possible to create a short game that can be enjoyably played more than once.

Scarygirl
Nathan Jurevicius
9/20/2009
http://www.scarygirl.com/

Scarygirl is an online flash platform game. The combination of unique graphics and interesting story lines sets this game apart from many traditional platform games. The creator shows their unique style while creating an enjoyable game. The design forms a complete site rather than an obvious shell with content loaded in.

Educational Flash Games
9/21/2009
http://flashgamesite.com/educational/educational.php

Educational Flash Games is a repository of various internet based learning games. This site will be helpful in choosing different types of games to use in my thesis.

Got Milk?
9/19/2009
http://www.gotmilk.com/

Got Milk? is an online interactive immersive website that uses games to teach users about the health benefits of milk. The site uses simple 2D elements and 3D renderings together to create an environment in which the games are located, each one fitting in seamlessly with each other. This site illustrates a more cohesive experience I would like to emulate in my thesis project.

QuakeQuizSF
9/21/2009
http://quakequizsf.org/

QuakeQuizSF is an online interactive instructional website educating residents of San Francisco on earthquake safety. Humor and amusing animations are used to make the serious subject matter more enjoyable. This site helps my thesis by

demonstrating how other serious subject matter can be delivered in a light-hearted manner while not diminishing from the content.

Black Holes: Gravity's Relentless Pull
HubbleSite
9/22/2009
http://hubblesite.org/explore_astronomy/black_holes/modules.html

Black Holes is an interactive flash website educating users on the science behind black holes. The site uses short games to illustrate important topics and allows the user to navigate through the content at their own pace. The site provides the information both through the interactive method while also offering a comprehensive content overview for those looking for straight information. While the scope of this site is much larger than I could accomplish in one year it is a good example of mixing scientific content with interactive content.

Launchball
London Science Museum
9/22/2009
http://www.sciencemuseum.org.uk/launchpad/launchball/

Launchball is a physics game using gravity and simple interactions between objects to solve puzzles. It demonstrates one kind of engaging game I can adapt to my subject matter.

Get the Glass!
California Milk Processor Board
10/12/2009
http://gettheglass.com/

Get the Glass is an online board game. The environment is very immersive and beautifully rendered. This game manages to slip educational information into a very addictive game that is fun to play even if you don't care about learning about the benefits of milk.

Simple Machines
Museum of Science and Industry, Chicago
10/12/2009
http://www.msichicago.org/fileadmin/Activities/Games/simple_machines/

Simple Machines is another educational game teaching the physics of simple machines using several small games. They use cute little characters to guide you through the exercises which I found to be an effective way of leading the user through the site.

Cheestrings
Kerry Foods
10/12/2009
http://mrstrings.co.uk/

Cheestrings is another online game but this one is a little confusing and not very easy to figure out. It does have a very interesting way of designing your own character. It was hard to figure out how to proceed and very hard to find any sort of instructions.

Based on these sources I believe my project to be viable as long as I am careful what stem cell information to use and I probably have more sources dealing with stem cells than I require. I need to avoid anything too clinical while including all the information necessary for basic understanding of the subject matter. As for the Flash games themselves I believe these sources will provide more than enough examples to develop my own set of games. Studying current games has led me to understand that is important for each of the games included in my thesis to tie back into the main menu system and each other to create a cohesive whole. I need to reuse design elements in each rather than creating an entire new design scheme for each game.

Project Description

Design

- Use visuals to convey scientific information with a minimal amount of text.
- Build a shell that immerses the user in the content.
- Each game will be re-playable and enjoyable even if the content doesn't interest the user.

Games

There will be 3 to 5 games introducing basic information about stem cells. Content will include but is not limited to how embryonic stem cells are harvested, the difference between embryonic stem cells, adult stem cells, and induced pluriopotent stem cells, what makes stem cells so different than other cells in the body and current successful research.

You will be able to start with any of the games but they will be built in a cyclical fashion, each building off the ones before and after it. Once the user finishes all the games they will have a deeper understanding of stem cells.

Each game will give the user a price if successfully complete and if they are able to collect them all it will unlock a final stage.

Subjects and Participants

- Kathryn Golden, biochemical engineer. She will help me make sure my information is accurate and significant.
- Percivia employees have volunteered to test the games and the accuracy of the stem cell information.
- I plan to use Facebook to find a selection of testers for my thesis. I will include a short online survey to gather their reactions and see if my thesis successfully informs them about stem cells.
- I will also use RIT Design students, asking them to concentrate on critiquing the design elements rather than the success of the educational aspect.

Computer Graphics

- I will primarily use Flash to build my thesis relying heavily on ActionScript 3.0. If necessary, I will render parts in Maya to build the shell environment.

Testing Procedure

- Each participant will be able to visit my thesis over the web and be asked to fill out a short web-based survey.

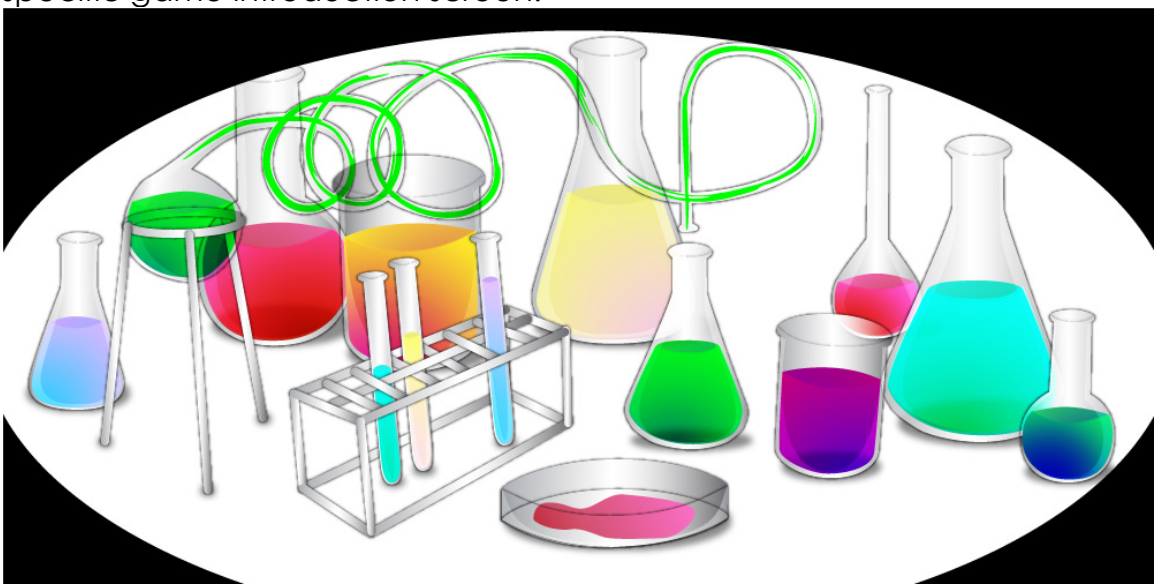
Technology

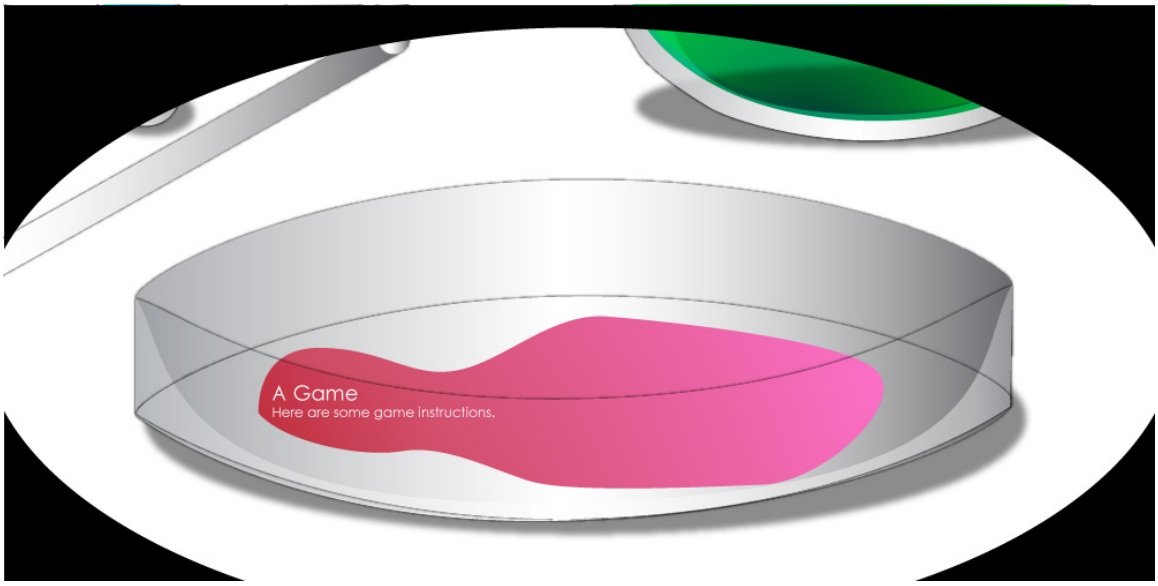
- Access to the internet
- Flash Player 10

Sketches

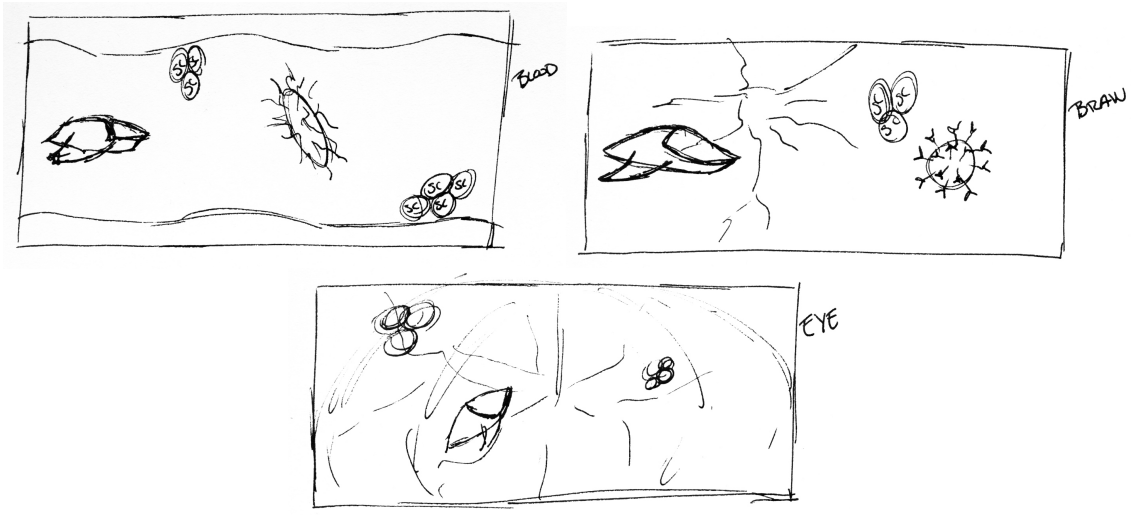
Early concept of the introductory stage.

Further development of the introductory stage including zooming in to a specific game introduction screen.

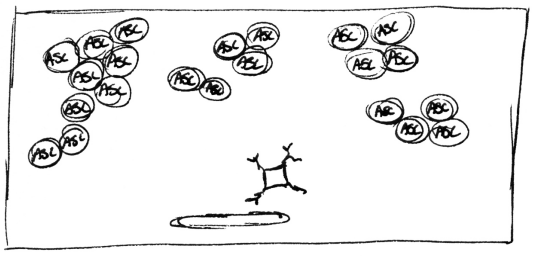




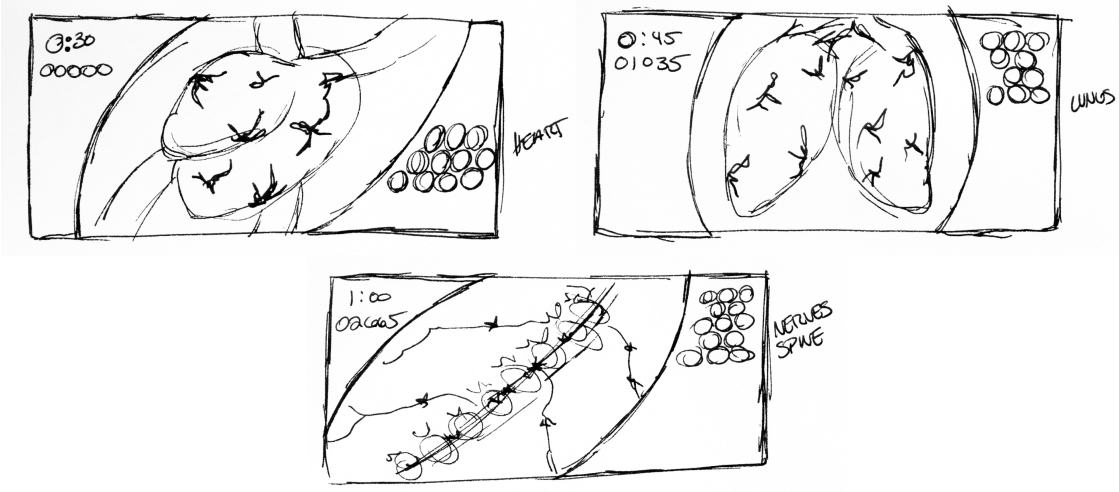
Early Game Exploration:
Searching for stem cells game



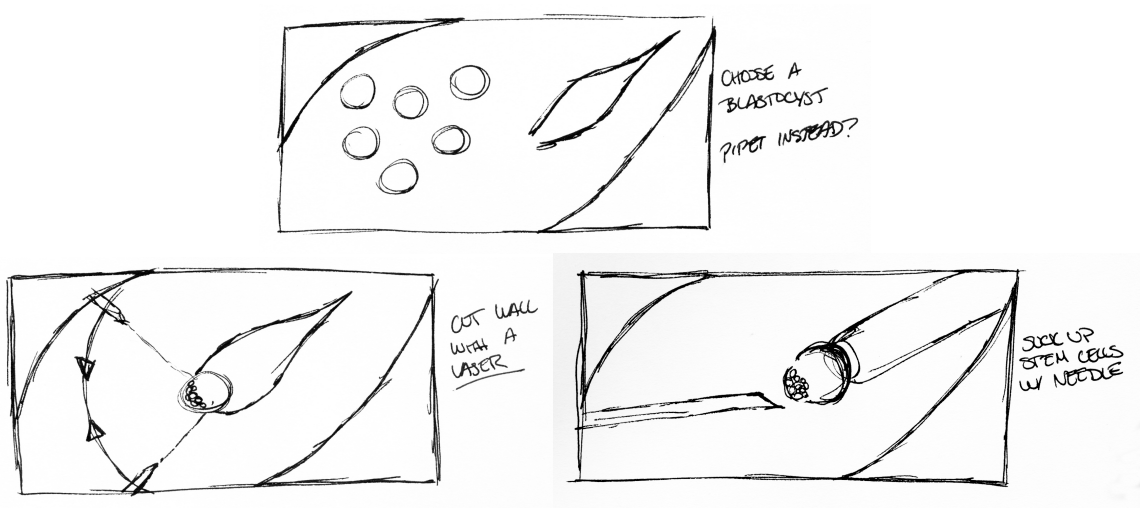
Stem cells brickles game



Using stem cells to repair damaged organs game



Harvesting embryonic stem cells game


CHOOSE A BLASTOCYST
PIPET INSTEAD?
CUT WALL WITH A LASER
SUCK UP STEM CELLS W NEEDLE

Budget

Monetary

- $35 – URL purchase (http://www.stemcelltastic.com)
- $500 – Adobe Master Suite CS5

Time

- Research will be completed by Christmas break.
- The shell will be finished by Christmas break.
- Each game will be completed in two week periods starting during Christmas break.
- For details see attached Timeline.

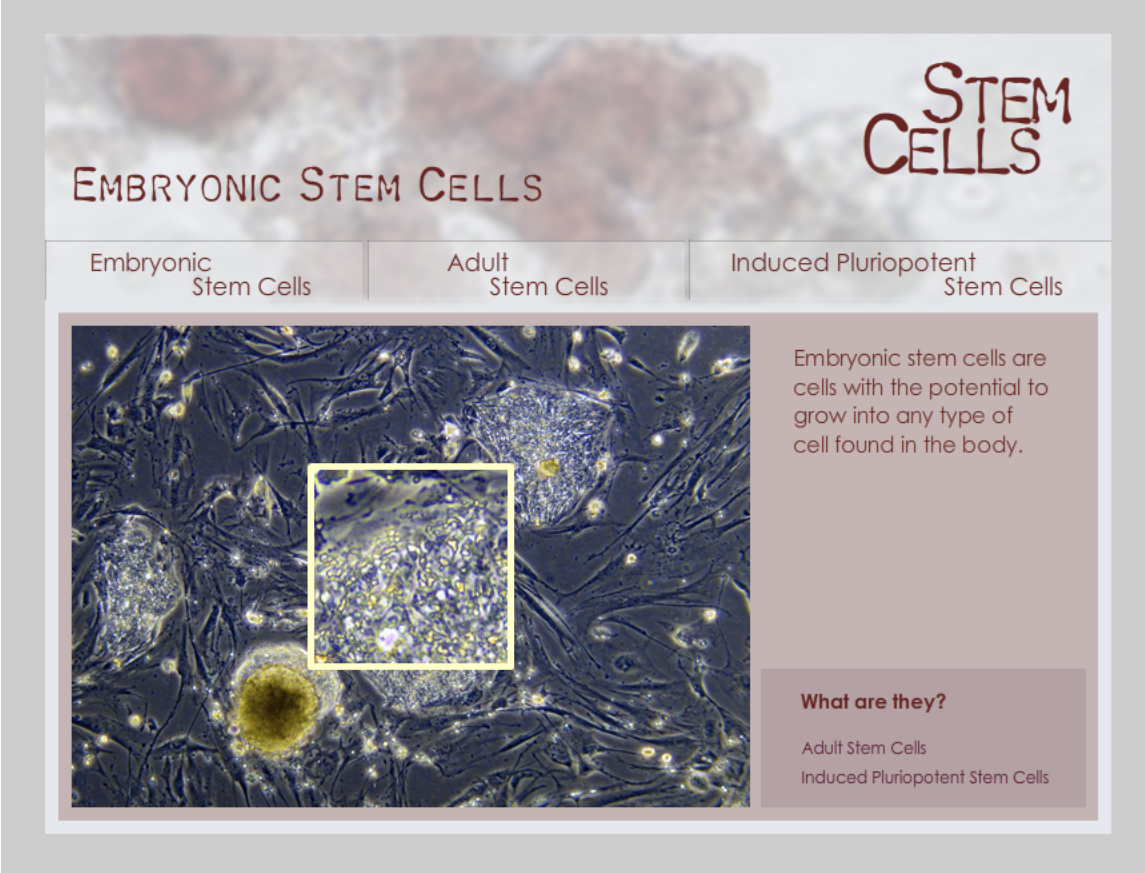
Marketing Plan

- Allow free web distribution on an educational basis.
- Submit to Siggraph.
- Submit to scientific design competitions.

Supporting Documents

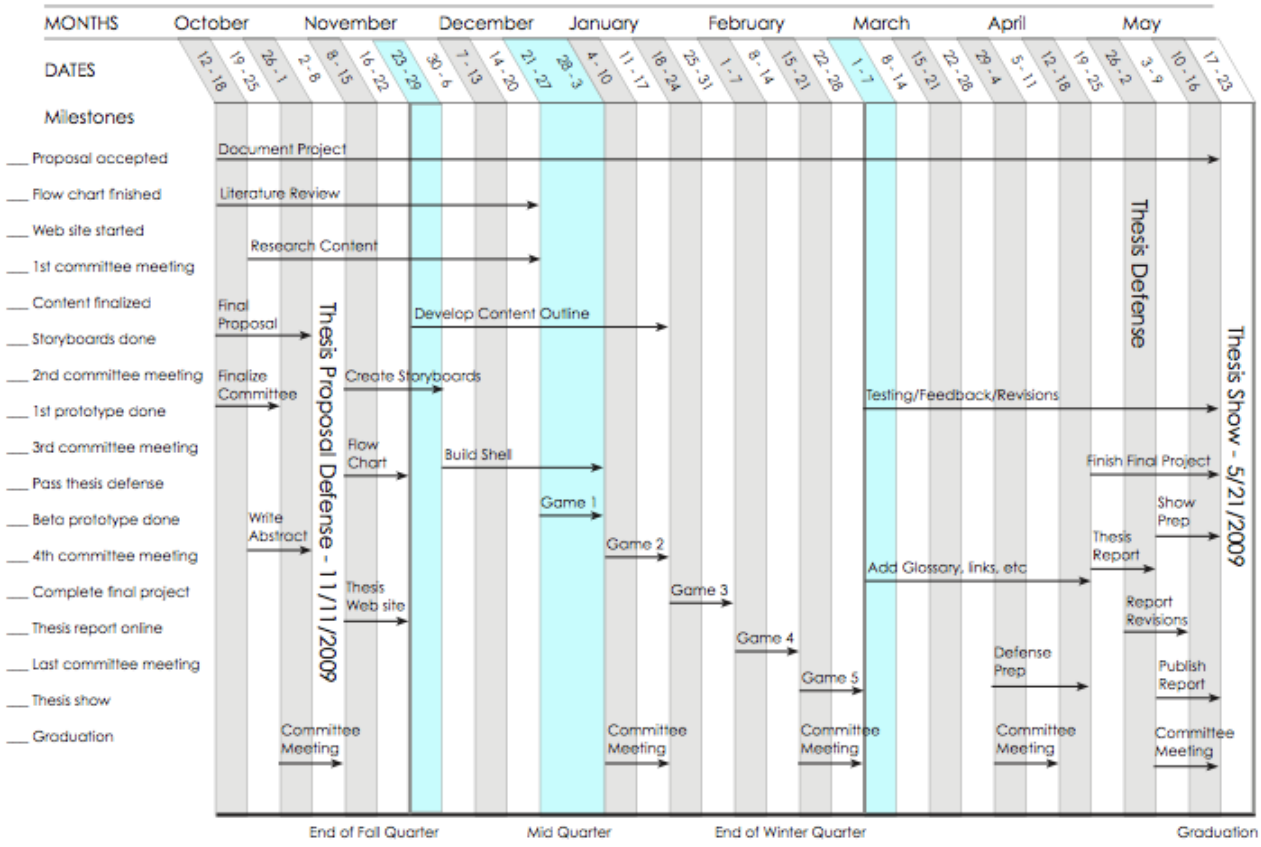
I began exploring this idea in my Production Pipeline project last spring. The output was not as successful as I had hoped so I have changed several aspects for my thesis. I have decided on a different base layout and am concentrating on incorporating entertainment.

http://www.peacefullycareening.com/productionpipeline/StemCells.html



Thesis Timeline

Interactive Stem Cells: Instructional Multimedia Game Design
by Sarah Hudson



6.2 **ACTIONSCRIPT:**

6.2.1 STAGE:

```
import com.greensock.*;
import com.greensock.easing.*;

stop();
var backgroundSound:Sound = new Sound();

backgroundSound.load(new URLRequest("background.mp3"));

var soundSet:SoundTransform = new SoundTransform();
soundSet.volume=0.5;

var myChannel:SoundChannel=backgroundSound.play(0,999,soundSet);

var pausedPosition:int;

play_btn.addEventListener(MouseEvent.CLICK, playSound);
pause_btn.addEventListener(MouseEvent.CLICK, pauseSound);
stop_btn.addEventListener(MouseEvent.CLICK, stopSound);

function playSound(evt:MouseEvent):void {
	myChannel=backgroundSound.play(pausedPosition);
}
function pauseSound(evt:MouseEvent):void {
	pausedPosition=myChannel.position;
	myChannel.stop();
}
function stopSound(evt:MouseEvent):void {
	myChannel.stop();
	pausedPosition=0;
}

back_btn.visible=false;
help_mc.visible=false;
dish_btn.visible=true;
ybeaker_btn.visible=false;
pbeaker_btn.visible=false;
help_mc.buttonMode=true;

loader_mc.visible=false;


function getHelp(e:MouseEvent) {
	joe_mc.visible=true;
	bubble_mc.visible=true;
	bubble_mc.closeBubble_btn.addEventListener(MouseEvent.CLICK, closeWelcome);
	help_mc.visible=false;
}

var myLevel:int=1;

dish_btn.addEventListener(MouseEvent.CLICK, playDish);
dish_btn.addEventListener(MouseEvent.CLICK, closeWelcome);
bubble_mc.closeBubble_btn.addEventListener(MouseEvent.CLICK, closeWelcome);
stage.addEventListener(Event.ENTER_FRAME, checkAlways);

ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
ybeaker_btn.addEventListener(MouseEvent.CLICK, closeWelcome);
pbeaker_btn.addEventListener(MouseEvent.CLICK, playPbeaker);
pbeaker_btn.addEventListener(MouseEvent.CLICK, closeWelcome);

function checkAlways(e:Event) {
	if (bg_mc.currentFrame==5) {
		if (myLevel==1) {
```

```
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
            }

            if (myLevel==2) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
                ybeaker_btn.visible=true;
                ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
            }
            if (myLevel==3) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
                ybeaker_btn.visible=true;
                ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
                pbeaker_btn.visible=true;
                pbeaker_btn.addEventListener(MouseEvent.CLICK, playPbeaker);
            }
        }
        if (bg_mc.currentFrame==99) {
            if (myLevel==1) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
            }
            if (myLevel==2) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
                ybeaker_btn.visible=true;
                ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
            }
            if (myLevel==3) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
                ybeaker_btn.visible=true;
                ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
                pbeaker_btn.visible=true;
                pbeaker_btn.addEventListener(MouseEvent.CLICK, playPbeaker);
            }
        }
        if (bg_mc.currentFrame==191) {
            if (myLevel==1) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
            }
            if (myLevel==2) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
                ybeaker_btn.visible=true;
                ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
            }
            if (myLevel==3) {
                dish_btn.visible=true;
                dish_btn.addEventListener(MouseEvent.CLICK, playDish);
                ybeaker_btn.visible=true;
                ybeaker_btn.addEventListener(MouseEvent.CLICK, playYbeaker);
                pbeaker_btn.visible=true;
                pbeaker_btn.addEventListener(MouseEvent.CLICK, playPbeaker);
            }
        }
}


function closeWelcome(e:MouseEvent) {
        bubble_mc.closeBubble_btn.removeEventListener(MouseEvent.CLICK, closeWelcome);
        help_mc.addEventListener(MouseEvent.CLICK, getHelp);
        joe_mc.visible=false;
```

```
	bubble_mc.visible=false;
	help_mc.visible=true;
	bubble_mc.gotoAndStop(1);
}

function playDish(e:Event) {
	bg_mc.gotoAndStop("dish_start");
	TweenMax.to(bg_mc, 1.5, {frame:95});
	dish_btn.visible=false;
	dish_btn.removeEventListener(MouseEvent.CLICK, playDish);
	ybeaker_btn.visible=false;
	pbeaker_btn.visible=false;
	back_btn.visible=true;
	stage.removeEventListener(Event.ENTER_FRAME, checkAlways);
}

function playYbeaker(e:Event) {
	bg_mc.gotoAndStop("ybeaker_start");
	TweenMax.to(bg_mc, 1.5, {frame:189});
	dish_btn.visible=false;
	ybeaker_btn.visible=false;
	pbeaker_btn.visible=false;
	back_btn.visible=true;
	stage.removeEventListener(Event.ENTER_FRAME, checkAlways);
}

function playPbeaker(e:Event) {
	bg_mc.gotoAndStop("pbeaker_start");
	TweenMax.to(bg_mc, 1.5, {frame:280});
	dish_btn.visible=false;
	ybeaker_btn.visible=false;
	pbeaker_btn.visible=false;
	back_btn.visible=true;
	stage.removeEventListener(Event.ENTER_FRAME, checkAlways);
}

back_btn.addEventListener(MouseEvent.CLICK, goBack);

function goBack(e:Event) {
	stage.addEventListener(Event.ENTER_FRAME, checkAlways);
	back_btn.visible=false;
	if (bg_mc.currentFrame==95) {
		TweenMax.to(bg_mc, 1.5, {frame:5});
		bg_mc.dishStart_btn.visible=false;
	}
	if (bg_mc.currentFrame==189) {
		TweenMax.to(bg_mc, 1.5, {frame:99});
		bg_mc.yBeakerStart_btn.visible=false;
	}
	if (bg_mc.currentFrame==280) {
		TweenMax.to(bg_mc, 1.5, {frame:191});
		bg_mc.pBeakerStart_btn.visible=false;
	}
}
function goBack2() {

	stage.addEventListener(Event.ENTER_FRAME, checkAlways);
	back_btn.visible=false;
	if (bg_mc.currentFrame==95) {
		TweenMax.to(bg_mc, 1.5, {frame:5});
		bg_mc.dishStart_btn.visible=false;
	}
	if (bg_mc.currentFrame==189) {
		TweenMax.to(bg_mc, 1.5, {frame:99});
		bg_mc.yBeakerStart_btn.visible=false;
	}
```

```
	if (bg_mc.currentFrame==280) {
		TweenMax.to(bg_mc, 1.5, {frame:191});
		bg_mc.pBeakerStart_btn.visible=false;
	}
}

var mainLoader:Loader = new Loader();
var mainFile:URLRequest=new URLRequest("stage1.swf");

mainLoader.contentLoaderInfo.addEventListener(ProgressEvent.PROGRESS, showProgress);

function showProgress(event:ProgressEvent) {
	var percent:int = (event.target.bytesLoaded / event.target.bytesTotal) * 100;
	loader_mc.gotoAndStop(percent);
}

mainLoader.contentLoaderInfo.addEventListener(Event.COMPLETE, mainComplete);

function mainComplete(event:Event) {
	loader_mc.visible=false;
	mainLoader.x=0;
	mainLoader.y=0;
	addChildAt(mainLoader, numChildren - 4);
	setChildIndex(title_mc, numChildren - 6);
}
bg_mc.dishStart_btn.visible=false;
bg_mc.yBeakerStart_btn.visible=false;
bg_mc.pBeakerStart_btn.visible=false;
bg_mc.dishStart_btn.addEventListener(MouseEvent.CLICK, dishGame);
bg_mc.yBeakerStart_btn.addEventListener(MouseEvent.CLICK, yBeakerGame);
bg_mc.pBeakerStart_btn.addEventListener(MouseEvent.CLICK, pBeakerGame);

function dishGame(e:MouseEvent) {
	mainFile=new URLRequest("stage1.swf");
	mainLoader.load(mainFile);
	setChildIndex(pause_btn, numChildren - 1);
	setChildIndex(stop_btn, numChildren - 1);
	setChildIndex(play_btn, numChildren - 1);
	setChildIndex(audio, numChildren - 1);
}

function yBeakerGame(e:MouseEvent) {
	mainFile=new URLRequest("stage2.swf");
	mainLoader.load(mainFile);
	setChildIndex(pause_btn, numChildren - 1);
	setChildIndex(stop_btn, numChildren - 1);
	setChildIndex(play_btn, numChildren - 1);
	setChildIndex(audio, numChildren - 1);

}


function pBeakerGame(e:MouseEvent) {
	mainFile=new URLRequest("stage3.swf");
	mainLoader.load(mainFile);
	setChildIndex(pause_btn, numChildren - 1);
	setChildIndex(stop_btn, numChildren - 1);
	setChildIndex(play_btn, numChildren - 1);
	setChildIndex(audio, numChildren - 1);

}
bubble_mc.more_btn.addEventListener(MouseEvent.CLICK, moreInfo);
bubble_mc.last_btn.addEventListener(MouseEvent.CLICK, lastInfo);

function moreInfo(e:MouseEvent) {
	bubble_mc.nextFrame();
```

```
}
function lastInfo(e:MouseEvent) {
	bubble_mc.prevFrame();
}
```

6.2.2 GAME 1:

```
import com.greensock.*;
import com.greensock.easing.*;

stop();
bubble_mc.buttonMode=true;
bubble_mc.demo.buttonMode=true;

var bodyX:Number=body_mc.x;
var bodyY:Number=body_mc.y;
var bodyScaleX:Number=body_mc.scaleX;
var bodyScaleY:Number=body_mc.scaleY;
var myTime:int=100;
var upDown:Boolean=false;
var downDown:Boolean=false;
var leftDown:Boolean=false;
var rightDown:Boolean=false;
var score:int=0;
var thisLevel:int=1;
var speed:int=10;

bubble_mc.demo.addEventListener(MouseEvent.CLICK, replayMe);

function replayMe(e:MouseEvent) {
	bubble_mc.demo.gotoAndPlay(1);
}

nextLevel_btn.visible=false;

var buzzSound:Sound = new Sound();
buzzSound.load(new URLRequest("buzz.mp3"));

var chimeSound:Sound = new Sound();
chimeSound.load(new URLRequest("chime.mp3"));

help_mc.visible=false;
help_mc.buttonMode=true;

bubble_mc.closeBubble_btn.visible=true;
close_btn.visible=false;
replay_btn.visible=false;

var damageFrame:int=1;
trace(damageFrame);
body_mc.gotoAndStop(damageFrame);

function checkKeysDown(e:KeyboardEvent) {
	if (e.keyCode==37) {
		rightDown=true;
	}
	if (e.keyCode==65) {
		rightDown=true;
	}
	if (e.keyCode==39) {
		leftDown=true;
	}
	if (e.keyCode==68) {
		leftDown=true;
	}
	if (e.keyCode==38) {
```

```
            downDown=true;
        }
        if (e.keyCode==87) {
            downDown=true;
        }
        if (e.keyCode==40) {
            upDown=true;
        }
        if (e.keyCode==83) {
            upDown=true;
        }
}
function checkKeysUp(e:KeyboardEvent) {
        if (e.keyCode==37) {
            rightDown=false;
        }
        if (e.keyCode==65) {
            rightDown=false;
        }
        if (e.keyCode==39) {
            leftDown=false;
        }
        if (e.keyCode==68) {
            leftDown=false;
        }
        if (e.keyCode==38) {
            downDown=false;
        }
        if (e.keyCode==87) {
            downDown=false;
        }
        if (e.keyCode==40) {
            upDown=false;
        }
        if (e.keyCode==83) {
            upDown=false;
        }
}

function zoomMe(e:KeyboardEvent) {
        if (e.keyCode==88&&body_mc.scaleX<=3) {
            body_mc.scaleX+=.2;
            body_mc.scaleY+=.2;
        }
        if (e.keyCode==90&&body_mc.scaleX>1) {
            body_mc.scaleX-=.2;
            body_mc.scaleY-=.2;
        }
}

function moveYou(e:Event) {
        if (upDown) {
            if (e.target.y>=0-e.target.height/2+stage.stageHeight) {
                e.target.y-=speed;
            }
        }
        if (downDown) {
            if (e.target.y<=e.target.height/2) {
                e.target.y+=speed;
            }
        }
        if (leftDown) {
            if (e.target.x>=0-e.target.width/2+stage.stageWidth) {
                e.target.x-=speed;
            }
        }
```

```
		if (rightDown) {
			if (e.target.x<=e.target.width/2) {
				e.target.x+=speed;
			}
		}
}

for (var i:int = 1; i <= 15; i++) {
		this["sc"+i+"_mc"].buttonMode=true;
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
}

var origX1:Number=sc1_mc.x;
var origY1:Number=sc1_mc.y;
var origX2:Number=sc2_mc.x;
var origY2:Number=sc2_mc.y;
var origX3:Number=sc3_mc.x;
var origY3:Number=sc3_mc.y;
var origX4:Number=sc4_mc.x;
var origY4:Number=sc4_mc.y;
var origX5:Number=sc5_mc.x;
var origY5:Number=sc5_mc.y;
var origX6:Number=sc6_mc.x;
var origY6:Number=sc6_mc.y;
var origX7:Number=sc7_mc.x;
var origY7:Number=sc7_mc.y;
var origX8:Number=sc8_mc.x;
var origY8:Number=sc8_mc.y;
var origX9:Number=sc9_mc.x;
var origY9:Number=sc9_mc.y;
var origX10:Number=sc10_mc.x;
var origY10:Number=sc10_mc.y;
var origX11:Number=sc11_mc.x;
var origY11:Number=sc11_mc.y;
var origX12:Number=sc12_mc.x;
var origY12:Number=sc12_mc.y;
var origX13:Number=sc13_mc.x;
var origY13:Number=sc13_mc.y;
var origX14:Number=sc14_mc.x;
var origY14:Number=sc14_mc.y;
var origX15:Number=sc15_mc.x;
var origY15:Number=sc15_mc.y;

var healed:int=15;

function dragCell(e:MouseEvent):void {
		e.target.startDrag();
		setChildIndex(MovieClip(e.target), numChildren - 1);
		trace(e.target.name);
}

function stopCell(e:MouseEvent) {
		stopDrag();
		for (var q = 1; q <= 15; q ++) {
			if (e.target.hitTestObject(MovieClip(body_mc["d"+q+"_mc"]))) {
				e.target.x=body_mc["d"+q+"_mc"].x;
				e.target.y=body_mc["d"+q+"_mc"].y;
				healed--;
				trace(healed);
				e.target.visible=false;

				score++;
				body_mc["d"+q+"_mc"].visible=false;
				if
(body_mc.d1_mc.visible==false&&body_mc.d2_mc.visible==false&&body_mc.brain.currentFrame!=20) {
```

```
                    body_mc.brain.play();
                }
                if
(body_mc.d3_mc.visible==false&&body_mc.d5_mc.visible==false&&body_mc.lungs.currentFrame!=20) {
                    body_mc.lungs.play();
                }
                if (body_mc.d4_mc.visible==false&&body_mc.heart.currentFrame!=20) {
                    body_mc.heart.play();
                }
                if
(body_mc.d6_mc.visible==false&&body_mc.d8_mc.visible==false&&body_mc.liver.currentFrame!=20) {
                    body_mc.liver.play();
                }
                if
(body_mc.d10_mc.visible==false&&body_mc.d11_mc.visible==false&&body_mc.d12_mc.visible==false&
&body_mc.d13_mc.visible==false&&body_mc.guts.currentFrame!=20) {
                    body_mc.guts.play();
                }
                if
(body_mc.d7_mc.visible==false&&body_mc.d9_mc.visible==false&&body_mc.d14_mc.visible==false&&
body_mc.d15_mc.visible==false&&body_mc.veins.currentFrame!=20) {
                    body_mc.veins.play();
                }
                chimeSound.play(0,1);

                checkWon();
            }
        }

}
function checkWon() {
    if (healed==0&&thisLevel<=3) {

        myTimer.stop();
        healed=15;
        thisLevel+=1;
        myTime-=20;

        nextLevel_btn.visible=true;
        nextLevel_btn.addEventListener(MouseEvent.CLICK, goNext);
        body_mc.guts.gotoAndStop(1);
        body_mc.lungs.gotoAndStop(1);
        body_mc.brain.gotoAndStop(1);
        body_mc.liver.gotoAndStop(1);
        body_mc.heart.gotoAndStop(1);
        bubble_mc.visible=false;
        close_btn.visible=false;
        replay_btn.visible=false;
        joe_mc.visible=false;
        help_mc.visible=true;
    }
    if (thisLevel==4) {
        trace("you won");
        nextLevel_btn.visible=false;
        nextLevel_btn.removeEventListener(MouseEvent.CLICK, goNext);
        joe_mc.visible=true;
        bubble_mc.visible=true;
        help_mc.visible=false;
        bubble_mc.gotoAndStop("youWon");
        setChildIndex(bubble_mc, numChildren - 1);
        setChildIndex(joe_mc, numChildren - 1);
        setChildIndex(close_btn, numChildren - 1);
        setChildIndex(replay_btn, numChildren - 1);
        myTimer.stop();
        joe_mc.lEye.gotoAndStop("happy");
        joe_mc.rEye.gotoAndStop("happy");
```

```
	}
	if (startTime==0) {
		trace("you lose");
		joe_mc.visible=true;
		bubble_mc.visible=true;
		help_mc.visible=false;
		bubble_mc.gotoAndStop("youLost");
		setChildIndex(bubble_mc, numChildren - 1);
		setChildIndex(joe_mc, numChildren - 1);
		setChildIndex(close_btn, numChildren - 1);
		setChildIndex(replay_btn, numChildren - 1);
	}
}

var startTime:Number=100;
timer_txt.text=String(startTime);

var myTimer:Timer=new Timer(1000);
myTimer.addEventListener(TimerEvent.TIMER, countDown);

function countDown(e:TimerEvent):void {
	startTime--;
	timer_txt.text=String(startTime);
	if (startTime==0) {
		trace("timer done");
		myTimer.stop();
		trace("you lose");
		joe_mc.visible=true;
		bubble_mc.visible=true;
		help_mc.visible=false;
		bubble_mc.gotoAndStop("youLost");
		setChildIndex(bubble_mc, numChildren - 1);
		setChildIndex(joe_mc, numChildren - 1);
		setChildIndex(close_btn, numChildren - 1);
		setChildIndex(replay_btn, numChildren - 1);
	}
}

bubble_mc.addEventListener(MouseEvent.CLICK, startGame);

function startGame(e:MouseEvent) {
	joe_mc.lEye.gotoAndStop(1);
	joe_mc.rEye.gotoAndStop(1);
	whatLevel.gotoAndStop(1);
	nextLevel_btn.visible=false;
	body_mc.veins.gotoAndStop(1);
	body_mc.guts.gotoAndStop(1);
	body_mc.lungs.gotoAndStop(1);
	body_mc.brain.gotoAndStop(1);
	body_mc.liver.gotoAndStop(1);
	body_mc.heart.gotoAndStop(1);
	body_mc.gotoAndStop(1);
	bubble_mc.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	close_btn.visible=false;
	replay_btn.visible=false;
	bubble_mc.removeEventListener(MouseEvent.CLICK, startGame);
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
	stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
	stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
	stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
	startTime=myTime;
	myTimer.start();
}
```

```
function goNext(e:MouseEvent) {
	body_mc.gotoAndStop(thisLevel);
	trace(thisLevel);
	whatLevel.nextFrame();
	nextLevel_btn.visible=false;
	body_mc.veins.gotoAndStop(1);
	body_mc.guts.gotoAndStop(1);
	body_mc.lungs.gotoAndStop(1);
	body_mc.brain.gotoAndStop(1);
	body_mc.liver.gotoAndStop(1);
	body_mc.heart.gotoAndStop(1);
	bubble_mc.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	close_btn.visible=false;
	replay_btn.visible=false;
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
	stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
	stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
	stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
	for (var i:int = 1; i <= 15; i++) {
		this["sc"+i+"_mc"].buttonMode=true;
		this["sc"+i+"_mc"].visible=true;
		this["sc"+i+"_mc"].gotoAndStop(1);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
	}
	for (var q = 1; q <= 15; q ++) {
		body_mc["d"+q+"_mc"].visible=true;
		body_mc["d"+q+"_mc"].alpha=1;
	}
	setOrig();
	startTime=myTime;
	myTimer.start();
}

function helpMe(e:MouseEvent) {
	trace("HELPME");
	help_mc.visible=false;
	bubble_mc.closeBubble_btn.visible=true;
	help_mc.removeEventListener(MouseEvent.CLICK, helpMe);
	bubble_mc.visible=true;
	bubble_mc.demo.gotoAndPlay(1);
	joe_mc.visible=true;
	bubble_mc.addEventListener(MouseEvent.CLICK, closeHelp);
	myTimer.stop();
	setChildIndex(bubble_mc, numChildren - 1);
	setChildIndex(joe_mc, numChildren - 1);
}

function closeHelp(e:MouseEvent) {
	bubble_mc.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	bubble_mc.removeEventListener(MouseEvent.CLICK, closeHelp);
	myTimer.start();
}

replay_btn.addEventListener(MouseEvent.CLICK, playAgain);
function playAgain(e:MouseEvent) {
	joe_mc.lEye.gotoAndStop(1);
	joe_mc.rEye.gotoAndStop(1);
	whatLevel.gotoAndStop(1);
	body_mc.veins.gotoAndStop(1);
```

```
		body_mc.guts.gotoAndStop(1);
		body_mc.lungs.gotoAndStop(1);
		body_mc.brain.gotoAndStop(1);
		body_mc.liver.gotoAndStop(1);
		body_mc.heart.gotoAndStop(1);
		body_mc.gotoAndStop(1);
		bubble_mc.visible=false;
		close_btn.visible=false;
		replay_btn.visible=false;
		joe_mc.visible=false;
		help_mc.visible=true;
		body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
		stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
		stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
		stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
		for (var i:int = 1; i <= 15; i++) {
			this["sc"+i+"_mc"].buttonMode=true;
			this["sc"+i+"_mc"].visible=true;
			this["sc"+i+"_mc"].gotoAndStop(1);
			this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
			this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
		}
		for (var q = 1; q <= 15; q ++) {
			body_mc["d"+q+"_mc"].visible=true;
			body_mc["d"+q+"_mc"].alpha=1;
		}
		setOrig();
		thisLevel=1;
		body_mc.gotoAndStop(thisLevel);
		body_mc.x=bodyX;
		body_mc.y=bodyY;
		body_mc.scaleX=bodyScaleX;
		body_mc.scaleY=bodyScaleY;
		bubble_mc.gotoAndStop(1);
		myTime=100;
		startTime=myTime;
		myTimer.start();
		score=0;
}

function setOrig() {
		sc1_mc.x=origX1;
		sc1_mc.y=origY1;
		sc2_mc.x=origX2;
		sc2_mc.y=origY2;
		sc3_mc.x=origX3;
		sc3_mc.y=origY3;
		sc4_mc.x=origX4;
		sc4_mc.y=origY4;
		sc5_mc.x=origX5;
		sc5_mc.y=origY5;
		sc6_mc.x=origX6;
		sc6_mc.y=origY6;
		sc7_mc.x=origX7;
		sc7_mc.y=origY7;
		sc8_mc.x=origX8;
		sc8_mc.y=origY8;
		sc9_mc.x=origX9;
		sc9_mc.y=origY9;
		sc10_mc.x=origX10;
		sc10_mc.y=origY10;
		sc11_mc.x=origX11;
		sc11_mc.y=origY11;
		sc12_mc.x=origX12;
		sc12_mc.y=origY12;
		sc13_mc.x=origX13;
```

```
        sc13_mc.y=origY13;
        sc14_mc.x=origX14;
        sc14_mc.y=origY14;
        sc15_mc.x=origX15;
        sc15_mc.y=origY15;
    }

    close_btn.addEventListener(MouseEvent.CLICK, return2Scene);
    function return2Scene(e:MouseEvent) {
        MovieClip(parent.parent).goBack2();
        MovieClip(parent.parent).myLevel=2;
        MovieClip(parent.parent).removeChild(MovieClip(parent.parent).mainLoader);
    }
```

6.2.3 GAME 2:

```
    import com.greensock.*;
    import com.greensock.easing.*;

    stop();

    help_mc.visible=false;
    bubble_mc.buttonMode=true;
    nextLevel_btn.visible=false;
    var thisLevel:int=1;

    var bodyOrigX:Number=body_mc.x;
    var bodyOrigY:Number=body_mc.y;
    var bodyScaleX:Number=body_mc.scaleX;
    var bodyScaleY:Number=body_mc.scaleY;

    var myTime:int=100;

    var buzzSound:Sound = new Sound();
    buzzSound.load(new URLRequest("buzz.mp3"));

    var chimeSound:Sound = new Sound();
    chimeSound.load(new URLRequest("chime.mp3"));

    var upDown:Boolean=false;
    var downDown:Boolean=false;
    var leftDown:Boolean=false;
    var rightDown:Boolean=false;

    help_mc.buttonMode=true;

    bubble_mc.closeBubble_btn.visible=true;
    close_btn.visible=false;
    replay_btn.visible=false;

    var score:Number=0;
    var speed:int=10;

    var origX1:Number=sc1_mc.x;
    var origY1:Number=sc1_mc.y;
    var origX2:Number=sc2_mc.x;
    var origY2:Number=sc2_mc.y;
    var origX3:Number=sc3_mc.x;
    var origY3:Number=sc3_mc.y;
    var origX4:Number=sc4_mc.x;
    var origY4:Number=sc4_mc.y;
    var origX5:Number=sc5_mc.x;
    var origY5:Number=sc5_mc.y;
    var origX6:Number=sc6_mc.x;
    var origY6:Number=sc6_mc.y;
    var origX7:Number=sc7_mc.x;
```

```
var origY7:Number=sc7_mc.y;
var origX8:Number=g1_mc.x;
var origY8:Number=g1_mc.y;
var origX9:Number=g2_mc.x;
var origY9:Number=g2_mc.y;
var origX10:Number=l1_mc.x;
var origY10:Number=l1_mc.y;
var origX11:Number=b1_mc.x;
var origY11:Number=b1_mc.y;
var origX12:Number=li1_mc.x;
var origY12:Number=li1_mc.y;
var origX13:Number=v1_mc.x;
var origY13:Number=v1_mc.y;
var origX14:Number=v2_mc.x;
var origY14:Number=v2_mc.y;
var origX15:Number=h1_mc.x;
var origY15:Number=h1_mc.y;

function checkKeysDown(e:KeyboardEvent) {
	if (e.keyCode==37) {
		rightDown=true;
	}
	if (e.keyCode==65) {
		rightDown=true;
	}
	if (e.keyCode==39) {
		leftDown=true;
	}
	if (e.keyCode==68) {
		leftDown=true;
	}
	if (e.keyCode==38) {
		downDown=true;
	}
	if (e.keyCode==87) {
		downDown=true;
	}
	if (e.keyCode==40) {
		upDown=true;
	}
	if (e.keyCode==83) {
		upDown=true;
	}
}
function checkKeysUp(e:KeyboardEvent) {
	if (e.keyCode==37) {
		rightDown=false;
	}
	if (e.keyCode==65) {
		rightDown=false;
	}
	if (e.keyCode==39) {
		leftDown=false;
	}
	if (e.keyCode==68) {
		leftDown=false;
	}
	if (e.keyCode==38) {
		downDown=false;
	}
	if (e.keyCode==87) {
		downDown=false;
	}
	if (e.keyCode==40) {
		upDown=false;
	}
```

```
	if (e.keyCode==83) {
		upDown=false;
	}
}

var bodyX:Number=body_mc.x;
var bodyY:Number=body_mc.y;
var bodyDiff:Number;
var bodyYOrig:Number=body_mc.y;
//body_mc.y = stage.stageHeight/2;

function zoomMe(e:KeyboardEvent) {
	if (e.keyCode==88&&body_mc.scaleX<=3) {
		bodyY=body_mc.y;
		body_mc.scaleX+=.2;
		body_mc.scaleY+=.2;
		body_mc.x=bodyX;
		bodyDiff=stage.stageHeight-body_mc.y;
		bodyY=body_mc.y;
	}
	if (e.keyCode==90&&body_mc.scaleX>1) {
		bodyY=body_mc.y;
		body_mc.scaleX-=.2;
		body_mc.scaleY-=.2;
		bodyDiff=Math.abs(bodyY-body_mc.y);
		body_mc.x=bodyX;
		bodyY=body_mc.y;
	}
}


function moveYou(e:Event) {
	if (upDown) {
		if (e.target.y>=0-e.target.height/2+stage.stageHeight) {
			e.target.y-=speed;
		}
	}
	if (downDown) {
		if (e.target.y<=e.target.height/2) {
			e.target.y+=speed;
		}
	}
	if (leftDown) {
		if (e.target.x>=0-e.target.width/2+stage.stageWidth) {
			e.target.x-=speed;
		}
	}
	if (rightDown) {
		if (e.target.x<=e.target.width/2) {
			e.target.x+=speed;
		}
	}
}

for (var i:int = 1; i <= 7; i++) {
	this["sc"+i+"_mc"].buttonMode=true;
	this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
}

b1_mc.buttonMode=true;
b1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

h1_mc.buttonMode=true;
h1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
```

```
h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

g1_mc.buttonMode=true;
g1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

g2_mc.buttonMode=true;
g2_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
g2_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

li1_mc.buttonMode=true;
li1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

l1_mc.buttonMode=true;
l1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

v1_mc.buttonMode=true;
v1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

v2_mc.buttonMode=true;
v2_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
v2_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);

var healed:int=15;

function dragCell(e:MouseEvent):void {
	e.target.startDrag();
	setChildIndex(MovieClip(e.target), numChildren - 1);
}

var scArray:Array=new Array(sc1_mc,sc2_mc,sc3_mc,sc4_mc,sc5_mc,sc6_mc,sc7_mc);

function stopCell(e:MouseEvent) {
	stopDrag();
	for (var t = 1; t <= 2; t++) {
		if (b1_mc.hitTestObject(MovieClip(body_mc["bd"+t+"_mc"]))) {
			b1_mc.x=body_mc["bd"+t+"_mc"].x;
			b1_mc.y=body_mc["bd"+t+"_mc"].y;
			healed--;
			b1_mc.visible=false;
			body_mc["bd"+t+"_mc"].visible=false;
			if (body_mc.bd1_mc.visible==false&&body_mc.bd2_mc.visible==false) {
				body_mc.brain.play();
			}
			chimeSound.play(0,1);
		}
	}
	for (var t2 = 1; t2 <= 2; t2++) {
		if (l1_mc.hitTestObject(MovieClip(body_mc["ld"+t2+"_mc"]))) {
			l1_mc.x=body_mc["ld"+t2+"_mc"].x;
			l1_mc.y=body_mc["ld"+t2+"_mc"].y;
			healed--;
			l1_mc.visible=false;
			body_mc["ld"+t2+"_mc"].visible=false;
			if (body_mc.ld1_mc.visible==false&&body_mc.ld2_mc.visible==false) {
				body_mc.lungs.play();
			}
			chimeSound.play(0,1);
		}
	}
	for (var t8 = 1; t8 <= 1; t8++) {
		if (h1_mc.hitTestObject(MovieClip(body_mc["hd"+t8+"_mc"]))) {
			h1_mc.x=body_mc["hd"+t8+"_mc"].x;
```

```
                h1_mc.y=body_mc["hd"+t8+"_mc"].y;
                healed--;
                h1_mc.visible=false;
                body_mc["hd"+t8+"_mc"].visible=false;
                if (body_mc.hd1_mc.visible==false) {
                    body_mc.heart.play();
                }
                chimeSound.play(0,1);
            }
        }
        for (var t3 = 1; t3 <= 2; t3 ++) {
            if (li1_mc.hitTestObject(MovieClip(body_mc["lid"+t3+"_mc"]))) {
                li1_mc.x=body_mc["lid"+t3+"_mc"].x;
                li1_mc.y=body_mc["lid"+t3+"_mc"].y;
                healed--;
                li1_mc.visible=false;
                body_mc["lid"+t3+"_mc"].visible=false;
                if (body_mc.lid1_mc.visible==false&&body_mc.lid2_mc.visible==false) {
                    body_mc.liver.play();
                }
                chimeSound.play(0,1);
            }
        }
        for (var t4 = 1; t4 <= 4; t4 ++) {
            if (v1_mc.hitTestObject(MovieClip(body_mc["vd"+t4+"_mc"]))) {
                v1_mc.x=body_mc["vd"+t4+"_mc"].x;
                v1_mc.y=body_mc["vd"+t4+"_mc"].y;
                healed--;
                v1_mc.visible=false;
                body_mc["vd"+t4+"_mc"].visible=false;
                if
(body_mc.vd1_mc.visible==false&&body_mc.vd2_mc.visible==false&&body_mc.vd3_mc.visible==false&
&body_mc.vd4_mc.visible==false) {
                    body_mc.veins.play();
                }
                chimeSound.play(0,1);
            }
        }
        for (var t5 = 1; t5 <= 4; t5 ++) {
            if (v2_mc.hitTestObject(MovieClip(body_mc["vd"+t5+"_mc"]))) {
                v2_mc.x=body_mc["vd"+t5+"_mc"].x;
                v2_mc.y=body_mc["vd"+t5+"_mc"].y;
                healed--;
                v2_mc.visible=false;
                body_mc["vd"+t5+"_mc"].visible=false;
                if
(body_mc.vd1_mc.visible==false&&body_mc.vd2_mc.visible==false&&body_mc.vd3_mc.visible==false&
&body_mc.vd4_mc.visible==false) {
                    body_mc.veins.play();
                }
                chimeSound.play(0,1);
            }
        }
        for (var t6 = 1; t6 <= 4; t6 ++) {
            if (g1_mc.hitTestObject(MovieClip(body_mc["id"+t6+"_mc"]))) {
                g1_mc.x=body_mc["id"+t6+"_mc"].x;
                g1_mc.y=body_mc["id"+t6+"_mc"].y;
                healed--;
                g1_mc.visible=false;
                body_mc["id"+t6+"_mc"].visible=false;
                if
(body_mc.id1_mc.visible==false&&body_mc.id2_mc.visible==false&&body_mc.id3_mc.visible==false&&
body_mc.id4_mc.visible==false) {
                    body_mc.guts.play();
                }
                chimeSound.play(0,1);
```

```
            }
        }
        for (var t7 = 1; t7 <= 4; t7 ++) {
            if (g2_mc.hitTestObject(MovieClip(body_mc["id"+t7+"_mc"]))) {
                g2_mc.x=body_mc["id"+t7+"_mc"].x;
                g2_mc.y=body_mc["id"+t7+"_mc"].y;
                healed--;
                g2_mc.visible=false;
                body_mc["id"+t7+"_mc"].visible=false;
                if
(body_mc.id1_mc.visible==false&&body_mc.id2_mc.visible==false&&body_mc.id3_mc.visible==false&&
body_mc.id4_mc.visible==false) {
                    body_mc.guts.play();
                }
                chimeSound.play(0,1);
            }
        }
        for (var scNum = 0; scNum <= scArray.length - 1; scNum++) {
            for (var t9 = 1; t9 <= 2; t9++) {
                if (scArray[scNum].hitTestObject(MovieClip(body_mc["bd"+t9+"_mc"]))) {
                    scArray[scNum].x=body_mc["bd"+t9+"_mc"].x;
                    scArray[scNum].y=body_mc["bd"+t9+"_mc"].y;
                    healed--;
                    scArray[scNum].visible=false;
                    body_mc["bd"+t9+"_mc"].visible=false;
                    if (body_mc.bd1_mc.visible==false&&body_mc.bd2_mc.visible==false) {
                        body_mc.brain.play();
                    }
                    chimeSound.play(0,1);
                }
            }
            for (var t21 = 1; t21 <= 2; t21++) {
                if (scArray[scNum].hitTestObject(MovieClip(body_mc["ld"+t21+"_mc"]))) {
                    scArray[scNum].x=body_mc["ld"+t21+"_mc"].x;
                    scArray[scNum].y=body_mc["ld"+t21+"_mc"].y;
                    healed--;
                    scArray[scNum].visible=false;
                    body_mc["ld"+t21+"_mc"].visible=false;
                    if (body_mc.ld1_mc.visible==false&&body_mc.ld2_mc.visible==false) {
                        body_mc.lungs.play();
                    }
                    chimeSound.play(0,1);
                }
            }
            for (var t81 = 1; t81 <= 1; t81++) {
                if (scArray[scNum].hitTestObject(MovieClip(body_mc["hd"+t81+"_mc"]))) {
                    scArray[scNum].x=body_mc["hd"+t81+"_mc"].x;
                    scArray[scNum].y=body_mc["hd"+t81+"_mc"].y;
                    healed--;
                    scArray[scNum].visible=false;
                    body_mc["hd"+t81+"_mc"].visible=false;
                    if (body_mc.hd1_mc.visible==false) {
                        body_mc.heart.play();
                    }
                    chimeSound.play(0,1);
                }
            }
            for (var t31 = 1; t31 <= 2; t31 ++) {
                if (scArray[scNum].hitTestObject(MovieClip(body_mc["lid"+t31+"_mc"]))) {
                    scArray[scNum].x=body_mc["lid"+t31+"_mc"].x;
                    scArray[scNum].y=body_mc["lid"+t31+"_mc"].y;
                    healed--;
                    scArray[scNum].visible=false;
                    body_mc["lid"+t31+"_mc"].visible=false;
                    if (body_mc.lid1_mc.visible==false&&body_mc.lid2_mc.visible==false) {
                        body_mc.liver.play();
```

```
                    }
                    chimeSound.play(0,1);
                }
            }
            for (var t41 = 1; t41 <= 4; t41 ++) {
                if (scArray[scNum].hitTestObject(MovieClip(body_mc["vd"+t41+"_mc"]))) {
                    scArray[scNum].x=body_mc["vd"+t41+"_mc"].x;
                    scArray[scNum].y=body_mc["vd"+t41+"_mc"].y;
                    healed--;
                    scArray[scNum].visible=false;
                    body_mc["vd"+t41+"_mc"].visible=false;
                    if
(body_mc.vd1_mc.visible==false&&body_mc.vd2_mc.visible==false&&body_mc.vd3_mc.visible==false&
&body_mc.vd4_mc.visible==false) {
                        body_mc.veins.play();
                    }
                    chimeSound.play(0,1);
                }
            }
            for (var t61 = 1; t61 <= 4; t61 ++) {
                if (scArray[scNum].hitTestObject(MovieClip(body_mc["id"+t61+"_mc"]))) {
                    scArray[scNum].x=body_mc["id"+t61+"_mc"].x;
                    scArray[scNum].y=body_mc["id"+t61+"_mc"].y;
                    healed--;
                    scArray[scNum].visible=false;
                    body_mc["id"+t61+"_mc"].visible=false;
                    if
(body_mc.id1_mc.visible==false&&body_mc.id2_mc.visible==false&&body_mc.id3_mc.visible==false&&
body_mc.id4_mc.visible==false) {
                        body_mc.guts.play();
                    }
                    chimeSound.play(0,1);
                }
            }
        }
        setOrig();
        checkWon();
}

function checkWon() {
        if (healed==0&&thisLevel<=3) {
            myTimer.stop();
            healed=15;
            thisLevel++;
            myTime-=20;
            nextLevel_btn.visible=true;
            nextLevel_btn.addEventListener(MouseEvent.CLICK, goNext);
        }
        if (thisLevel==4) {
            trace("you won");
            joe_mc.visible=true;
            bubble_mc.visible=true;
            help_mc.visible=false;
            nextLevel_btn.visible=false;
            nextLevel_btn.removeEventListener(MouseEvent.CLICK, goNext);
            joe_mc.lEye.gotoAndStop("happy");
            joe_mc.rEye.gotoAndStop("happy");
            bubble_mc.gotoAndStop("youWon");
            setChildIndex(bubble_mc, numChildren - 1);
            setChildIndex(joe_mc, numChildren - 1);
            setChildIndex(close_btn, numChildren - 1);
            setChildIndex(replay_btn, numChildren - 1);
            myTimer.stop();
            joe_mc.lEye.gotoAndStop("happy");
            joe_mc.rEye.gotoAndStop("happy");
        }
```

```
	if (startTime==0) {
		trace("you lose");
		joe_mc.visible=true;
		bubble_mc.visible=true;
		help_mc.visible=false;
		bubble_mc.gotoAndStop("youLost");
		setChildIndex(bubble_mc, numChildren - 1);
		setChildIndex(joe_mc, numChildren - 1);
		setChildIndex(close_btn, numChildren - 1);
		setChildIndex(replay_btn, numChildren - 1);
	}
}

var startTime:Number=100;
timer_txt.text=String(startTime);

var myTimer:Timer=new Timer(1000);
myTimer.addEventListener(TimerEvent.TIMER, countDown);

function countDown(e:TimerEvent):void {
	startTime--;
	timer_txt.text=String(startTime);

	if (startTime==0&&healed>=0) {
		trace("try again");
		myTimer.stop();
		trace("you lose");
		joe_mc.visible=true;
		bubble_mc.visible=true;
		help_mc.visible=false;
		bubble_mc.gotoAndStop("youLost");
		setChildIndex(bubble_mc, numChildren - 1);
		setChildIndex(joe_mc, numChildren - 1);
		setChildIndex(close_btn, numChildren - 1);
		setChildIndex(replay_btn, numChildren - 1);
	}
	if (startTime==0&&healed==0) {
		trace("unlock next level");
		myTimer.stop();
		joe_mc.visible=true;
		help_mc.visible=false;
	}
}

bubble_mc.addEventListener(MouseEvent.CLICK, startGame);

function startGame(e:MouseEvent) {
	nextLevel_btn.visible=false;
	bubble_mc.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
	stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
	stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
	stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
	bubble_mc.removeEventListener(MouseEvent.CLICK, startGame);
	startTime=myTime;
	myTimer.start();
	body_mc.veins.gotoAndStop(1);
	body_mc.guts.gotoAndStop(1);
	body_mc.lungs.gotoAndStop(1);
	body_mc.brain.gotoAndStop(1);
	body_mc.liver.gotoAndStop(1);
	body_mc.heart.gotoAndStop(1);
}
```

```
function goNext(e:MouseEvent) {
	whatLevel.nextFrame();
	body_mc.guts.gotoAndStop(1);
	body_mc.lungs.gotoAndStop(1);
	body_mc.brain.gotoAndStop(1);
	body_mc.liver.gotoAndStop(1);
	body_mc.heart.gotoAndStop(1);
	bubble_mc.visible=false;
	close_btn.visible=false;
	replay_btn.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
	stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
	stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
	stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
	for (var i:int = 1; i <= 7; i++) {
		this["sc"+i+"_mc"].buttonMode=true;
		this["sc"+i+"_mc"].visible=true;
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
	}
	b1_mc.buttonMode=true;
	b1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	b1_mc.visible=true;
	b1_mc.alpha=1;
	h1_mc.buttonMode=true;
	h1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	h1_mc.visible=true;
	h1_mc.alpha=1;
	g1_mc.buttonMode=true;
	g1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	g1_mc.visible=true;
	g1_mc.alpha=1;
	g2_mc.buttonMode=true;
	g2_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	g2_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	g2_mc.visible=true;
	g2_mc.alpha=1;
	li1_mc.buttonMode=true;
	li1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	li1_mc.visible=true;
	li1_mc.alpha=1;
	l1_mc.buttonMode=true;
	l1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	l1_mc.visible=true;
	l1_mc.alpha=1;
	v1_mc.buttonMode=true;
	v1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	v1_mc.visible=true;
	v1_mc.alpha=1;
	v2_mc.buttonMode=true;
	v2_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	v2_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	v2_mc.visible=true;
	v2_mc.alpha=1;
	body_mc.gotoAndStop(thisLevel);
	trace(body_mc.currentFrame);
```

```
		for (var q = 1; q <= 2; q ++) {
			body_mc["bd"+q+"_mc"].visible=true;
			body_mc["bd"+q+"_mc"].alpha=1;
		}
		for (var q2 = 1; q2 <= 2; q2 ++) {
			body_mc["ld"+q2+"_mc"].visible=true;
			body_mc["ld"+q2+"_mc"].alpha=1;
		}
		for (var q3 = 1; q3 <= 1; q3 ++) {
			body_mc["hd"+q3+"_mc"].visible=true;
			body_mc["hd"+q3+"_mc"].alpha=1;
		}
		for (var q4 = 1; q4 <= 2; q4 ++) {
			body_mc["lid"+q4+"_mc"].visible=true;
			body_mc["lid"+q4+"_mc"].alpha=1;
		}
		for (var q5 = 1; q5 <= 4; q5 ++) {
			body_mc["id"+q5+"_mc"].visible=true;
			body_mc["id"+q5+"_mc"].alpha=1;
		}
		for (var q6 = 1; q6 <= 4; q6 ++) {
			body_mc["vd"+q6+"_mc"].visible=true;
			body_mc["vd"+q6+"_mc"].alpha=1;
		}
		setOrig();
		nextLevel_btn.visible=false;
		bubble_mc.visible=false;
		joe_mc.visible=false;
		help_mc.visible=true;
		help_mc.addEventListener(MouseEvent.CLICK, helpMe);
		body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
		stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
		stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
		stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
		bubble_mc.removeEventListener(MouseEvent.CLICK, startGame);
		startTime=myTime;
		myTimer.start();
		body_mc.veins.gotoAndStop(1);
		body_mc.guts.gotoAndStop(1);
		body_mc.lungs.gotoAndStop(1);
		body_mc.brain.gotoAndStop(1);
		body_mc.liver.gotoAndStop(1);
		body_mc.heart.gotoAndStop(1);
		body_mc.nextFrame();

}

replay_btn.addEventListener(MouseEvent.CLICK, playAgain);
function playAgain(e:MouseEvent) {
		healed=15;
		joe_mc.lEye.gotoAndStop(1);
		joe_mc.rEye.gotoAndStop(1);
		body_mc.veins.gotoAndStop(1);
		body_mc.guts.gotoAndStop(1);
		body_mc.lungs.gotoAndStop(1);
		body_mc.brain.gotoAndStop(1);
		body_mc.liver.gotoAndStop(1);
		body_mc.gotoAndStop(1);
		body_mc.heart.gotoAndStop(1);
		bubble_mc.visible=false;
		close_btn.visible=false;
		replay_btn.visible=false;
		joe_mc.visible=false;
		help_mc.visible=true;
		help_mc.addEventListener(MouseEvent.CLICK, helpMe);
		body_mc.addEventListener(Event.ENTER_FRAME, moveYou);
```

```
stage.addEventListener(KeyboardEvent.KEY_DOWN, checkKeysDown);
stage.addEventListener(KeyboardEvent.KEY_UP, checkKeysUp);
stage.addEventListener(KeyboardEvent.KEY_UP, zoomMe);
for (var i:int = 1; i <= 7; i++) {
	this["sc"+i+"_mc"].buttonMode=true;
	this["sc"+i+"_mc"].visible=true;
	this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
}
b1_mc.buttonMode=true;
b1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
b1_mc.visible=true;
b1_mc.alpha=1;
h1_mc.buttonMode=true;
h1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
h1_mc.visible=true;
h1_mc.alpha=1;
g1_mc.buttonMode=true;
g1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
g1_mc.visible=true;
g1_mc.alpha=1;
g2_mc.buttonMode=true;
g2_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
g2_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
g2_mc.visible=true;
g2_mc.alpha=1;
li1_mc.buttonMode=true;
li1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
li1_mc.visible=true;
li1_mc.alpha=1;
l1_mc.buttonMode=true;
l1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
l1_mc.visible=true;
l1_mc.alpha=1;
v1_mc.buttonMode=true;
v1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
v1_mc.visible=true;
v1_mc.alpha=1;
v2_mc.buttonMode=true;
v2_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
v2_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
v2_mc.visible=true;
v2_mc.alpha=1;
for (var q = 1; q <= 2; q ++) {
	body_mc["bd"+q+"_mc"].visible=true;
	body_mc["bd"+q+"_mc"].alpha=1;
}
for (var q2 = 1; q2 <= 2; q2 ++) {
	body_mc["ld"+q2+"_mc"].visible=true;
	body_mc["ld"+q2+"_mc"].alpha=1;
}
for (var q3 = 1; q3 <= 1; q3 ++) {
	body_mc["hd"+q3+"_mc"].visible=true;
	body_mc["hd"+q3+"_mc"].alpha=1;
}
for (var q4 = 1; q4 <= 2; q4 ++) {
	body_mc["lid"+q4+"_mc"].visible=true;
	body_mc["lid"+q4+"_mc"].alpha=1;
}
for (var q5 = 1; q5 <= 4; q5 ++) {
```

```
            body_mc["id"+q5+"_mc"].visible=true;
            body_mc["id"+q5+"_mc"].alpha=1;
        }
        for (var q6 = 1; q6 <= 4; q6 ++) {
            body_mc["vd"+q6+"_mc"].visible=true;
            body_mc["vd"+q6+"_mc"].alpha=1;
        }
        setOrig();
        joe_mc.lEye.gotoAndStop(1);
        joe_mc.rEye.gotoAndStop(1);
        thisLevel=1;
        myTime=100;
        bubble_mc.gotoAndStop(1);
        body_mc.x=bodyOrigX;
        body_mc.y=bodyOrigY;
        body_mc.scaleX=bodyScaleX;
        body_mc.scaleY=bodyScaleY;
        startTime=myTime;
        myTimer.start();
        score=0;
}

function setOrig() {
        sc1_mc.x=origX1;
        sc1_mc.y=origY1;
        sc2_mc.x=origX2;
        sc2_mc.y=origY2;
        sc3_mc.x=origX3;
        sc3_mc.y=origY3;
        sc4_mc.x=origX4;
        sc4_mc.y=origY4;
        sc5_mc.x=origX5;
        sc5_mc.y=origY5;
        sc6_mc.x=origX6;
        sc6_mc.y=origY6;
        sc7_mc.x=origX7;
        sc7_mc.y=origY7;
        g1_mc.x=origX8;
        g1_mc.y=origY8;
        g2_mc.x=origX9;
        g2_mc.y=origY9;
        l1_mc.x=origX10;
        l1_mc.y=origY10;
        b1_mc.x=origX11;
        b1_mc.y=origY11;
        li1_mc.x=origX12;
        li1_mc.y=origY12;
        v1_mc.x=origX13;
        v1_mc.y=origY13;
        v2_mc.x=origX14;
        v2_mc.y=origY14;
        h1_mc.x=origX15;
        h1_mc.y=origY15;
}

function helpMe(e:MouseEvent) {
        help_mc.visible=false;
        help_mc.removeEventListener(MouseEvent.CLICK, helpMe);
        bubble_mc.visible=true;
        bubble_mc.demo.gotoAndPlay(1);
        joe_mc.visible=true;
        bubble_mc.addEventListener(MouseEvent.CLICK, closeHelp);
        myTimer.stop();
        setChildIndex(bubble_mc, numChildren - 1);
        setChildIndex(joe_mc, numChildren - 1);
```

```
}

function closeHelp(e:MouseEvent) {
	bubble_mc.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	bubble_mc.removeEventListener(MouseEvent.CLICK, closeHelp);
	myTimer.start();
}

close_btn.addEventListener(MouseEvent.CLICK, return2Scene);
function return2Scene(e:MouseEvent) {
	MovieClip(parent.parent).goBack2();
	MovieClip(parent.parent).myLevel++;
	MovieClip(parent.parent).removeChild(MovieClip(parent.parent).mainLoader);

}
```

6.2.4 GAME 3:

```
stop();

help_mc.visible=false;
help_mc.buttonMode=true;
close_btn.visible=false;
replay_btn.visible=false;
next_btn.visible=false;
next_btn.mouseEnabled=false;
var thisLevel:int=1;
nextLevel_btn.visible=false;

var scShot:Number=0;
var hShot:Number=0;
var gShot:Number=0;
var liShot:Number=0;
var lShot:Number=0;
var vShot:Number=0;
var bShot:Number=0;

var shot1:Number=0;
var shot2:Number=0;
var shot3:Number=0;
var shot4:Number=0;
var shot5:Number=0;
var shot6:Number=0;
var shot7:Number=0;

var slotsLeft:int=25;

var chimeSound:Sound = new Sound();
chimeSound.load(new URLRequest("chime.mp3"));

var sol1:int=1;
var sol2:int=2;
var sol3:int=5;
var sol4:int=6;
var sol5:int=7;
trace(sol1+", "+sol2+", "+sol3+", "+sol4+", "+sol5);

var try1:int;
var try2:int;
var try3:int;
var try4:int;
var try5:int;
```

```
var origX1:Number=sc1_mc.x;
var origY1:Number=sc1_mc.y;
var origX2:Number=sc2_mc.x;
var origY2:Number=sc2_mc.y;
var origX3:Number=sc3_mc.x;
var origY3:Number=sc3_mc.y;
var origX4:Number=sc4_mc.x;
var origY4:Number=sc4_mc.y;
var origX8:Number=g1_mc.x;
var origY8:Number=g1_mc.y;
var origX10:Number=l1_mc.x;
var origY10:Number=l1_mc.y;
var origX11:Number=b1_mc.x;
var origY11:Number=b1_mc.y;
var origX12:Number=li1_mc.x;
var origY12:Number=li1_mc.y;
var origX13:Number=v1_mc.x;
var origY13:Number=v1_mc.y;
var origX15:Number=h1_mc.x;
var origY15:Number=h1_mc.y;

var solArray:Array=new Array(sol1,sol2,sol3,sol4,sol5);

var tryArray:Array = new Array();

var color1:ColorTransform = new ColorTransform();
color1.color=0x00FF00;
var color2:ColorTransform = new ColorTransform();
color2.color=0xFF0000;
var color3:ColorTransform = new ColorTransform();
color3.color=0xFF9900;
var color4:ColorTransform = new ColorTransform();
color4.color=0xFFFF00;
var color5:ColorTransform = new ColorTransform();
color5.color=0xFF33CC;
var color6:ColorTransform = new ColorTransform();
color6.color=0x00FFFF;
var color7:ColorTransform = new ColorTransform();
color7.color=0x9900FF;

for (var tube:int = 1; tube<= 5; tube++) {
	this["tube"+tube+"_mc"].visible=false;
}

function initializeCells() {

	for (var i:int = 1; i <= 4; i++) {
		this["sc"+i+"_mc"].buttonMode=true;
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell1);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell2);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell3);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell4);
		this["sc"+i+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopCell5);
		this["sc"+i+"_mc"].visible=true;
		this["sc"+i+"_mc"].gotoAndStop(1);
		this["sc"+i+"_mc"].mouseEnabled=true;
	}
	b1_mc.buttonMode=true;
	b1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
	b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
	b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell1);
	b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell2);
	b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell3);
	b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell4);
```

```
        b1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell5);
        b1_mc.visible=true;
        b1_mc.gotoAndStop(1);
        b1_mc.mouseEnabled=true;

        h1_mc.buttonMode=true;
        h1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
        h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
        h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell1);
        h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell2);
        h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell3);
        h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell4);
        h1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell5);
        h1_mc.visible=true;
        h1_mc.gotoAndStop(1);
        h1_mc.mouseEnabled=true;

        g1_mc.buttonMode=true;
        g1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
        g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
        g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell1);
        g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell2);
        g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell3);
        g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell4);
        g1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell5);
        g1_mc.visible=true;
        g1_mc.gotoAndStop(1);
        g1_mc.mouseEnabled=true;

        li1_mc.buttonMode=true;
        li1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
        li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
        li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell1);
        li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell2);
        li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell3);
        li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell4);
        li1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell5);
        li1_mc.visible=true;
        li1_mc.gotoAndStop(1);
        li1_mc.mouseEnabled=true;

        l1_mc.buttonMode=true;
        l1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
        l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
        l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell1);
        l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell2);
        l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell3);
        l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell4);
        l1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell5);
        l1_mc.visible=true;
        l1_mc.gotoAndStop(1);
        l1_mc.mouseEnabled=true;

        v1_mc.buttonMode=true;
        v1_mc.addEventListener(MouseEvent.MOUSE_DOWN, dragCell);
        v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell);
        v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell1);
        v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell2);
        v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell3);
        v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell4);
        v1_mc.addEventListener(MouseEvent.MOUSE_UP, stopCell5);
        v1_mc.visible=true;
        v1_mc.gotoAndStop(1);
        v1_mc.mouseEnabled=true;
}
```

```
initializeCells();
function dragCell(e:MouseEvent):void {
	e.target.startDrag();
	setChildIndex(MovieClip(e.target), numChildren - 1);
	trace(e.target.name);
}

var dishArray:Array=new Array(dish1_mc,dish2_mc,dish3_mc,dish4_mc,dish5_mc);

function stopCell(e:MouseEvent) {
	stopDrag();
}
function stopCell1(e:MouseEvent) {
	stopDrag();
	if (e.target.hitTestObject(dish1_mc)) {
		e.target.x=dish1_mc.x;
		e.target.y=dish1_mc.y;
		e.target.play();
		chimeSound.play(0,1);
		e.target.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		e.target.removeEventListener(MouseEvent.MOUSE_DOWN, stopCell);
		e.target.buttonMode=false;
		e.target.mouseEnabled=false;
		dish1_mc.visible=false;
		dishArray.pop();
		for (var i:int = 1; i <= 4; i++) {
			this["sc"+i+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
		}
		b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
		h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
		l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
		li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
		v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
		g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell1);
	}
	if (dishArray.length==0) {
		next_btn.visible=true;
		bg_mc.ins_mc.nextFrame();
		next_btn.mouseEnabled=true;
		next_btn.addEventListener(MouseEvent.CLICK, goTubes);

		b1_mc.buttonMode=false;

		b1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

		h1_mc.buttonMode=false;

		h1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

		g1_mc.buttonMode=false;

		g1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

		li1_mc.buttonMode=false;

		li1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

		l1_mc.buttonMode=false;

		l1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
		l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
```

```
            v1_mc.buttonMode=false;

            v1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            for (var i2:int = 1; i2 <= 4; i2++) {
                  this["sc"+i2+"_mc"].buttonMode=false;

                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            }
      }

}
function stopCell2(e:MouseEvent) {
      stopDrag();
      if (e.target.hitTestObject(dish2_mc)) {
            e.target.x=dish2_mc.x;
            e.target.y=dish2_mc.y;
            e.target.play();
            chimeSound.play(0,1);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, stopCell);
            e.target.buttonMode=false;
            e.target.mouseEnabled=false;
            dish2_mc.visible=false;
            dishArray.pop();
            for (var i:int = 1; i <= 4; i++) {
                  this["sc"+i+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
            }
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell2);
      }
      if (dishArray.length==0) {
            next_btn.visible=true;
            bg_mc.ins_mc.nextFrame();
            next_btn.mouseEnabled=true;
            next_btn.addEventListener(MouseEvent.CLICK, goTubes);

            b1_mc.buttonMode=false;

            b1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            h1_mc.buttonMode=false;

            h1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            g1_mc.buttonMode=false;

            g1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            li1_mc.buttonMode=false;

            li1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            l1_mc.buttonMode=false;

            l1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
```

```
            v1_mc.buttonMode=false;

            v1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            for (var i2:int = 1; i2 <= 4; i2++) {
                  this["sc"+i2+"_mc"].buttonMode=false;

                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            }
      }

}
function stopCell3(e:MouseEvent) {
      stopDrag();
      if (e.target.hitTestObject(dish3_mc)) {
            e.target.x=dish3_mc.x;
            e.target.y=dish3_mc.y;
            e.target.play();
            chimeSound.play(0,1);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, stopCell);
            e.target.buttonMode=false;
            e.target.mouseEnabled=false;
            dish3_mc.visible=false;
            dishArray.pop();
            for (var i:int = 1; i <= 4; i++) {
                  this["sc"+i+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
            }
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell3);
      }
      if (dishArray.length==0) {
            next_btn.visible=true;
            bg_mc.ins_mc.nextFrame();
            next_btn.mouseEnabled=true;
            next_btn.addEventListener(MouseEvent.CLICK, goTubes);

            b1_mc.buttonMode=false;

            b1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            h1_mc.buttonMode=false;

            h1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            g1_mc.buttonMode=false;

            g1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            li1_mc.buttonMode=false;

            li1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            l1_mc.buttonMode=false;

            l1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
```

```
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            v1_mc.buttonMode=false;

            v1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            for (var i2:int = 1; i2 <= 4; i2++) {
                  this["sc"+i2+"_mc"].buttonMode=false;

                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            }
      }

}
function stopCell4(e:MouseEvent) {
      stopDrag();
      if (e.target.hitTestObject(dish4_mc)) {
            e.target.x=dish4_mc.x;
            e.target.y=dish4_mc.y;
            e.target.play();
            chimeSound.play(0,1);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, stopCell);
            e.target.buttonMode=false;
            e.target.mouseEnabled=false;
            dish4_mc.visible=false;
            dishArray.pop();
            for (var i:int = 1; i <= 4; i++) {
                  this["sc"+i+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
            }
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell4);
      }
      if (dishArray.length==0) {
            next_btn.visible=true;
            bg_mc.ins_mc.nextFrame();
            next_btn.mouseEnabled=true;
            next_btn.addEventListener(MouseEvent.CLICK, goTubes);

            b1_mc.buttonMode=false;

            b1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            h1_mc.buttonMode=false;

            h1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            g1_mc.buttonMode=false;

            g1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            li1_mc.buttonMode=false;

            li1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            l1_mc.buttonMode=false;
```

```
            l1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            v1_mc.buttonMode=false;

            v1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            for (var i2:int = 1; i2 <= 4; i2++) {
                  this["sc"+i2+"_mc"].buttonMode=false;

                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            }
      }

}
function stopCell5(e:MouseEvent) {
      stopDrag();
      if (e.target.hitTestObject(dish5_mc)) {
            e.target.x=dish5_mc.x;
            e.target.y=dish5_mc.y;
            e.target.play();
            chimeSound.play(0,1);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            e.target.removeEventListener(MouseEvent.MOUSE_DOWN, stopCell);
            e.target.buttonMode=false;
            e.target.mouseEnabled=false;
            dish5_mc.visible=false;
            dishArray.pop();
            for (var i:int = 1; i <= 4; i++) {
                  this["sc"+i+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
            }
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell5);
      }
      if (dishArray.length==0) {
            next_btn.visible=true;
            bg_mc.ins_mc.nextFrame();
            next_btn.mouseEnabled=true;
            next_btn.addEventListener(MouseEvent.CLICK, goTubes);

            b1_mc.buttonMode=false;

            b1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            b1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            h1_mc.buttonMode=false;

            h1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            h1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            g1_mc.buttonMode=false;

            g1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            g1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            li1_mc.buttonMode=false;

            li1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            li1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            l1_mc.buttonMode=false;
```

```
            l1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            l1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);

            v1_mc.buttonMode=false;

            v1_mc.removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
            v1_mc.removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            for (var i2:int = 1; i2 <= 4; i2++) {
                  this["sc"+i2+"_mc"].buttonMode=false;

                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_DOWN, dragCell);
                  this["sc"+i2+"_mc"].removeEventListener(MouseEvent.MOUSE_UP, stopCell);
            }
      }

}

function goTubes(e:MouseEvent) {
      bg_mc.nextFrame();
      joe_mc.visible=true;
      bubble_mc.visible=true;
      bubble_mc.gotoAndStop("partTwo");
      help_mc.visible=false;
      bubble_mc.addEventListener(MouseEvent.CLICK, closeHelp);
      for (var i:int = 1; i <= 4; i++) {
            this["sc"+i+"_mc"].visible=false;
      }
      b1_mc.visible=false;
      h1_mc.visible=false;
      g1_mc.visible=false;
      li1_mc.visible=false;
      l1_mc.visible=false;
      v1_mc.visible=false;
      for (var tube:int = 1; tube<= 5; tube++) {
            this["tube"+tube+"_mc"].visible=true;
      }
      for (var beakNum:int = 1; beakNum <=7; beakNum++) {
            this["color"+beakNum+"_mc"].buttonMode=true;
            this["color"+beakNum+"_mc"].addEventListener(MouseEvent.MOUSE_DOWN, dragBeaker);
            this["color"+beakNum+"_mc"].addEventListener(MouseEvent.MOUSE_UP, stopBeaker);
      }
      next_btn.visible=false;
      setChildIndex(bubble_mc, numChildren - 1);
      setChildIndex(joe_mc, numChildren - 1);
}
function dragBeaker(e:MouseEvent):void {
      e.target.startDrag();
      setChildIndex(MovieClip(e.target), numChildren - 1);
      trace(e.target.name);
}
var origCX1:int=color1_mc.x;
var origCY1:int=color1_mc.y;
var origCX2:int=color2_mc.x;
var origCY2:int=color2_mc.y;
var origCX3:int=color3_mc.x;
var origCY3:int=color3_mc.y;
var origCX4:int=color4_mc.x;
var origCY4:int=color4_mc.y;
var origCX5:int=color5_mc.x;
var origCY5:int=color5_mc.y;
var origCX6:int=color6_mc.x;
var origCY6:int=color6_mc.y;
var origCX7:int=color7_mc.x;
var origCY7:int=color7_mc.y;
```

```
var whichBeaker:int=1;

function stopBeaker(e:MouseEvent):void {
	stopDrag();
	trace("whichBeaker is "+whichBeaker);

	if (whichBeaker==1) {
		stage.addEventListener(Event.ENTER_FRAME, checkTube1);
	}
	if (whichBeaker==2) {
		stage.addEventListener(Event.ENTER_FRAME, checkTube2);
	}
	if (whichBeaker==3) {
		stage.addEventListener(Event.ENTER_FRAME, checkTube3);
	}
	if (whichBeaker==4) {
		stage.addEventListener(Event.ENTER_FRAME, checkTube4);
	}
	if (whichBeaker==5) {
		stage.addEventListener(Event.ENTER_FRAME, checkTube5);
	}
}
var tube1Check:int=1;
var tube2Check:int=1;
var tube3Check:int=1;
var tube4Check:int=1;
var tube5Check:int=1;

function checkTube1(e:Event) {
	for (var beak:int = 1; beak <= 7; beak++) {

		if (this["color"+beak+"_mc"].hitTestObject(tube1_mc)) {
			trace("hit");
			chimeSound.play(0,1);
			tube1_mc.nextFrame();
			setBeakers();
			switch (beak) {
				case 1 :
					if (scShot>0) {
						shot1+=1;
						tube1_mc["tube1_"+tube1Check].transform.colorTransform=color1;
						tryArray.push(1);
						scShot--;
						am1_txt.text=String(scShot);
					}
					if (scShot==0) {
						color1_mc.gotoAndStop(1);
					}
					slotsLeft--;

					break;

				case 2 :
					if (hShot>0) {
						shot2+=1;
						tube1_mc["tube1_"+tube1Check].transform.colorTransform=color2;
						tryArray.push(2);
						hShot--;
						am2_txt.text=String(hShot);
					}
					if (hShot==0) {
						color2_mc.gotoAndStop(1);
					}
					slotsLeft--;

					break;
```

```
case 3 :
	if (bShot>0) {
		shot3+=1;
		tube1_mc["tube1_"+tube1Check].transform.colorTransform=color3;
		tryArray.push(3);
		bShot--;
		am3_txt.text=String(bShot);
	}
	if (bShot==0) {
		color3_mc.gotoAndStop(1);
	}
	slotsLeft--;

	break;
case 4 :
	if (gShot>0) {
		shot4+=1;
		tube1_mc["tube1_"+tube1Check].transform.colorTransform=color4;
		tryArray.push(4);
		gShot--;
		am4_txt.text=String(gShot);
	}
	if (gShot==0) {
		color4_mc.gotoAndStop(1);
	}
	slotsLeft--;

	break;
case 5 :
	if (liShot>0) {
		shot5+=1;
		tube1_mc["tube1_"+tube1Check].transform.colorTransform=color5;
		tryArray.push(5);
		liShot--;
		am5_txt.text=String(liShot);
	}
	if (liShot==0) {
		color5_mc.gotoAndStop(1);
	}
	slotsLeft--;

	break;
case 6 :
	if (vShot>0) {
		shot6+=1;
		tube1_mc["tube1_"+tube1Check].transform.colorTransform=color6;
		tryArray.push(6);
		vShot--;
		am6_txt.text=String(vShot);
	}
	if (vShot==0) {
		color6_mc.gotoAndStop(1);
	}
	slotsLeft--;

	break;
case 7 :
	if (lShot>0) {
		shot7+=1;
		tube1_mc["tube1_"+tube1Check].transform.colorTransform=color7;
		tryArray.push(7);
		lShot--;
		am7_txt.text=String(lShot);
	}
	if (lShot==0) {
		color7_mc.gotoAndStop(1);
```

```
                        }
                        slotsLeft--;

                        break;
                }
                tube1Check++;
                trace(tryArray);
        }
        if (shot1+shot2+shot3+shot4+shot5+shot6+shot7==5) {
                if (tryArray[0]==solArray[0]) {
                        tube1_mc.tube1_1.nextFrame();
                }
                if (tryArray[1]==solArray[1]) {
                        tube1_mc.tube1_2.nextFrame();
                }
                if (tryArray[2]==solArray[2]) {
                        tube1_mc.tube1_3.nextFrame();
                }
                if (tryArray[3]==solArray[3]) {
                        tube1_mc.tube1_4.nextFrame();
                }
                if (tryArray[4]==solArray[4]) {
                        tube1_mc.tube1_5.nextFrame();
                }
                if
(tryArray[0]==solArray[0]&&tryArray[1]==solArray[1]&&tryArray[2]==solArray[2]&&tryArray[3]==solArray[3]
&&tryArray[4]==solArray[4]) {

                        youWin();
                }

                trace("one done");
                stage.addEventListener(Event.ENTER_FRAME, checkTube2);
                resetArray();
                whichBeaker++;
        }

    }
    stage.removeEventListener(Event.ENTER_FRAME, checkTube1);
}
function checkTube2(e:Event) {
    for (var beak:int = 1; beak <= 7; beak++) {

        if (this["color"+beak+"_mc"].hitTestObject(tube2_mc)) {
                trace("hit");
                tube2_mc.nextFrame();
                chimeSound.play(0,1);
                setBeakers();
                switch (beak) {
                        case 1 :
                                if (scShot>0) {
                                        shot1+=1;
                                        tube2_mc["tube2_"+tube2Check].transform.colorTransform=color1;
                                        tryArray.push(1);
                                        scShot--;
                                        am1_txt.text=String(scShot);
                                }
                                if (scShot==0) {
                                        color1_mc.gotoAndStop(1);
                                }
                                slotsLeft--;
                                break;
                        case 2 :
                                if (hShot>0) {
                                        shot2+=1;
                                        tube2_mc["tube2_"+tube2Check].transform.colorTransform=color2;
```

```
            tryArray.push(2);
            hShot--;
            am2_txt.text=String(hShot);
        }
        if (hShot==0) {
            color2_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 3 :
        if (bShot>0) {
            shot3+=1;
            tube2_mc["tube2_"+tube2Check].transform.colorTransform=color3;
            tryArray.push(3);
            bShot--;
            am3_txt.text=String(bShot);
        }
        if (bShot==0) {
            color3_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 4 :
        if (gShot>0) {
            shot4+=1;
            tube2_mc["tube2_"+tube2Check].transform.colorTransform=color4;
            tryArray.push(4);
            gShot--;
            am4_txt.text=String(gShot);
        }
        if (gShot==0) {
            color4_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 5 :
        if (liShot>0) {
            shot5+=1;
            tube2_mc["tube2_"+tube2Check].transform.colorTransform=color5;
            tryArray.push(5);
            liShot--;
            am5_txt.text=String(liShot);
        }
        if (liShot==0) {
            color5_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 6 :
        if (vShot>0) {
            shot6+=1;
            tube2_mc["tube2_"+tube2Check].transform.colorTransform=color6;
            tryArray.push(6);
            vShot--;
            am6_txt.text=String(vShot);
        }
        if (vShot==0) {
            color6_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 7 :
        if (lShot>0) {
            shot7+=1;
            tube2_mc["tube2_"+tube2Check].transform.colorTransform=color7;
            tryArray.push(7);
```

```
                        lShot--;
                        am7_txt.text=String(lShot);
                    }
                    if (lShot==0) {
                        color7_mc.gotoAndStop(1);
                    }
                    slotsLeft--;
                    break;
                }
                tube2Check++;
            }
            if (shot1+shot2+shot3+shot4+shot5+shot6+shot7==5) {
                if (tryArray[0]==solArray[0]) {
                    tube2_mc.tube2_1.nextFrame();
                }
                if (tryArray[1]==solArray[1]) {
                    tube2_mc.tube2_2.nextFrame();
                }
                if (tryArray[2]==solArray[2]) {
                    tube2_mc.tube2_3.nextFrame();
                }
                if (tryArray[3]==solArray[3]) {
                    tube2_mc.tube2_4.nextFrame();
                }
                if (tryArray[4]==solArray[4]) {
                    tube2_mc.tube2_5.nextFrame();
                }
                if
(tryArray[0]==solArray[0]&&tryArray[1]==solArray[1]&&tryArray[2]==solArray[2]&&tryArray[3]==solArray[3]
&&tryArray[4]==solArray[4]) {

                    youWin();
                }
                trace("one done");
                stage.addEventListener(Event.ENTER_FRAME, checkTube3);
                resetArray();
                whichBeaker++;
            }
        }
        stage.removeEventListener(Event.ENTER_FRAME, checkTube2);
}
function checkTube3(e:Event) {
        for (var beak:int = 1; beak <= 7; beak++) {

            if (this["color"+beak+"_mc"].hitTestObject(tube3_mc)) {
                trace("hit");
                chimeSound.play(0,1);
                tube3_mc.nextFrame();
                setBeakers();
                switch (beak) {
                    case 1 :
                        if (scShot>0) {
                            shot1+=1;
                            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color1;
                            tryArray.push(1);
                            scShot--;
                            am1_txt.text=String(scShot);
                        }
                        if (scShot==0) {
                            color1_mc.gotoAndStop(1);
                        }
                        slotsLeft--;
                        break;
                    case 2 :
                        if (hShot>0) {
                            shot2+=1;
```

```
            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color2;
            tryArray.push(2);
            hShot--;
            am2_txt.text=String(hShot);
        }
        if (hShot==0) {
            color2_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 3 :
        if (bShot>0) {
            shot3+=1;
            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color3;
            tryArray.push(3);
            bShot--;
            am3_txt.text=String(bShot);
        }
        if (bShot==0) {
            color3_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 4 :
        if (gShot>0) {
            shot4+=1;
            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color4;
            tryArray.push(4);
            gShot--;
            am4_txt.text=String(gShot);
        }
        if (gShot==0) {
            color4_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 5 :
        if (liShot>0) {
            shot5+=1;
            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color5;
            tryArray.push(5);
            liShot--;
            am5_txt.text=String(liShot);
        }
        if (liShot==0) {
            color5_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 6 :
        if (vShot>0) {
            shot6+=1;
            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color6;
            tryArray.push(6);
            vShot--;
            am6_txt.text=String(vShot);
        }
        if (vShot==0) {
            color6_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 7 :
        if (lShot>0) {
            shot7+=1;
            tube3_mc["tube3_"+tube3Check].transform.colorTransform=color7;
```

```
                                tryArray.push(7);
                                lShot--;
                                am7_txt.text=String(lShot);
                        }
                        if (lShot==0) {
                                color7_mc.gotoAndStop(1);
                        }
                        slotsLeft--;
                        break;
                }
                tube3Check++;
        }
        if (shot1+shot2+shot3+shot4+shot5+shot6+shot7==5) {
                if (tryArray[0]==solArray[0]) {
                        tube3_mc.tube3_1.nextFrame();
                }
                if (tryArray[1]==solArray[1]) {
                        tube3_mc.tube3_2.nextFrame();
                }
                if (tryArray[2]==solArray[2]) {
                        tube3_mc.tube3_3.nextFrame();
                }
                if (tryArray[3]==solArray[3]) {
                        tube3_mc.tube3_4.nextFrame();
                }
                if (tryArray[4]==solArray[4]) {
                        tube3_mc.tube3_5.nextFrame();
                }
                if
(tryArray[0]==solArray[0]&&tryArray[1]==solArray[1]&&tryArray[2]==solArray[2]&&tryArray[3]==solArray[3]
&&tryArray[4]==solArray[4]) {

                        youWin();
                }
                trace("one done");
                stage.addEventListener(Event.ENTER_FRAME, checkTube4);
                resetArray();
                whichBeaker++;
        }
    }
    stage.removeEventListener(Event.ENTER_FRAME, checkTube3);
}
function checkTube4(e:Event) {
    for (var beak:int = 1; beak <= 7; beak++) {

        if (this["color"+beak+"_mc"].hitTestObject(tube4_mc)) {
                trace("hit");
                tube4_mc.nextFrame();
                setBeakers();
                chimeSound.play(0,1);
                switch (beak) {
                        case 1 :
                                if (scShot>0) {
                                        shot1+=1;
                                        tube4_mc["tube4_"+tube4Check].transform.colorTransform=color1;
                                        tryArray.push(1);
                                        scShot--;
                                        am1_txt.text=String(scShot);
                                }
                                if (scShot==0) {
                                        color1_mc.gotoAndStop(1);
                                }
                                slotsLeft--;
                                break;
                        case 2 :
                                if (hShot>0) {
```

```
                shot2+=1;
                tube4_mc["tube4_"+tube4Check].transform.colorTransform=color2;
                tryArray.push(2);
                hShot--;
                am2_txt.text=String(hShot);
        }
        if (hShot==0) {
                color2_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
case 3 :
        if (bShot>0) {
                shot3+=1;
                tube4_mc["tube4_"+tube4Check].transform.colorTransform=color3;
                tryArray.push(3);
                bShot--;
                am3_txt.text=String(bShot);
        }
        if (bShot==0) {
                color3_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
case 4 :
        if (gShot>0) {
                shot4+=1;
                tube4_mc["tube4_"+tube4Check].transform.colorTransform=color4;
                tryArray.push(4);
                gShot--;
                am4_txt.text=String(gShot);
        }
        if (gShot==0) {
                color4_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
case 5 :
        if (liShot>0) {
                shot5+=1;
                tube4_mc["tube4_"+tube4Check].transform.colorTransform=color5;
                tryArray.push(5);
                liShot--;
                am5_txt.text=String(liShot);
        }
        if (liShot==0) {
                color5_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
case 6 :
        if (vShot>0) {
                shot6+=1;
                tube4_mc["tube4_"+tube4Check].transform.colorTransform=color6;
                tryArray.push(6);
                vShot--;
                am6_txt.text=String(vShot);
        }
        if (vShot==0) {
                color6_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
case 7 :
        if (lShot>0) {
                shot7+=1;
```

```
                                tube4_mc["tube4_"+tube4Check].transform.colorTransform=color7;
                                tryArray.push(7);
                                lShot--;
                                am7_txt.text=String(lShot);
                        }
                        if (lShot==0) {
                                color7_mc.gotoAndStop(1);
                        }
                        slotsLeft--;
                        break;
                }
                tube4Check++;
        }
        if (shot1+shot2+shot3+shot4+shot5+shot6+shot7==5) {
                if (tryArray[0]==solArray[0]) {
                        tube4_mc.tube4_1.nextFrame();
                }
                if (tryArray[1]==solArray[1]) {
                        tube4_mc.tube4_2.nextFrame();
                }
                if (tryArray[2]==solArray[2]) {
                        tube4_mc.tube4_3.nextFrame();
                }
                if (tryArray[3]==solArray[3]) {
                        tube4_mc.tube4_4.nextFrame();
                }
                if (tryArray[4]==solArray[4]) {
                        tube4_mc.tube4_5.nextFrame();
                }
                if
(tryArray[0]==solArray[0]&&tryArray[1]==solArray[1]&&tryArray[2]==solArray[2]&&tryArray[3]==solArray[3]
&&tryArray[4]==solArray[4]) {

                        youWin();
                }
                trace("one done");
                stage.addEventListener(Event.ENTER_FRAME, checkTube5);
                resetArray();
                whichBeaker++;
        }
    }
    stage.removeEventListener(Event.ENTER_FRAME, checkTube4);
}
function checkTube5(e:Event) {
    for (var beak:int = 1; beak <= 7; beak++) {

        if (this["color"+beak+"_mc"].hitTestObject(tube5_mc)) {
                trace("hit");
                tube5_mc.nextFrame();
                setBeakers();
                chimeSound.play(0,1);
                switch (beak) {
                        case 1 :
                                if (scShot>0) {
                                        shot1+=1;
                                        tube5_mc["tube5_"+tube5Check].transform.colorTransform=color1;
                                        tryArray.push(1);
                                        scShot--;
                                        am1_txt.text=String(scShot);
                                }
                                if (scShot==0) {
                                        color1_mc.gotoAndStop(1);
                                }
                                slotsLeft--;
                                break;
                        case 2 :
```

```
        if (hShot>0) {
            shot2+=1;
            tube5_mc["tube5_"+tube5Check].transform.colorTransform=color2;
            tryArray.push(2);
            hShot--;
            am2_txt.text=String(hShot);
        }
        if (hShot==0) {
            color2_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 3 :
        if (bShot>0) {
            shot3+=1;
            tube5_mc["tube5_"+tube5Check].transform.colorTransform=color3;
            tryArray.push(3);
            bShot--;
            am3_txt.text=String(bShot);
        }
        if (bShot==0) {
            color3_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 4 :
        if (gShot>0) {
            shot4+=1;
            tube5_mc["tube5_"+tube5Check].transform.colorTransform=color4;
            tryArray.push(4);
            gShot--;
            am4_txt.text=String(gShot);
        }
        if (gShot==0) {
            color4_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 5 :
        if (liShot>0) {
            shot5+=1;
            tube5_mc["tube5_"+tube5Check].transform.colorTransform=color5;
            tryArray.push(5);
            liShot--;
            am5_txt.text=String(liShot);
        }
        if (liShot==0) {
            color5_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 6 :
        if (vShot>0) {
            shot6+=1;
            tube5_mc["tube5_"+tube5Check].transform.colorTransform=color6;
            tryArray.push(6);
            vShot--;
            am6_txt.text=String(vShot);
        }
        if (vShot==0) {
            color6_mc.gotoAndStop(1);
        }
        slotsLeft--;
        break;
    case 7 :
        if (lShot>0) {
```

```
                                shot7+=1;
                                tube5_mc["tube5_"+tube5Check].transform.colorTransform=color7;
                                tryArray.push(7);
                                lShot--;
                                am7_txt.text=String(lShot);
                        }
                        if (lShot==0) {
                                color7_mc.gotoAndStop(1);
                        }
                        slotsLeft--;
                        break;
                }
                tube5Check++;
        }
        if (scShot+hShot+bShot+gShot+liShot+lShot+vShot==0&&slotsLeft>0) {
                youLose();
        }
        if (shot1+shot2+shot3+shot4+shot5+shot6+shot7==5) {
                if (tryArray[0]==solArray[0]) {
                        tube5_mc.tube5_1.nextFrame();
                }
                if (tryArray[1]==solArray[1]) {
                        tube5_mc.tube5_2.nextFrame();
                }
                if (tryArray[2]==solArray[2]) {
                        tube5_mc.tube5_3.nextFrame();
                }
                if (tryArray[3]==solArray[3]) {
                        tube5_mc.tube5_4.nextFrame();
                }
                if (tryArray[4]==solArray[4]) {
                        tube5_mc.tube5_5.nextFrame();
                }
                if
(tryArray[0]==solArray[0]&&tryArray[1]==solArray[1]&&tryArray[2]==solArray[2]&&tryArray[3]==solArray[3]
&&tryArray[4]==solArray[4]) {
                        youWin();
                } else {
                        youLose();
                }
                resetArray();
        }
    }
    stage.removeEventListener(Event.ENTER_FRAME, checkTube5);
}
function setBeakers() {
    color1_mc.x=origCX1;
    color1_mc.y=origCY1;
    color2_mc.x=origCX2;
    color2_mc.y=origCY2;
    color3_mc.x=origCX3;
    color3_mc.y=origCY3;
    color4_mc.x=origCX4;
    color4_mc.y=origCY4;
    color5_mc.x=origCX5;
    color5_mc.y=origCY5;
    color6_mc.x=origCX6;
    color6_mc.y=origCY6;
    color7_mc.x=origCX7;
    color7_mc.y=origCY7;
}
function resetArray() {
    shot1=0;
    shot2=0;
    shot3=0;
    shot4=0;
```

```
		shot5=0;
		shot6=0;
		shot7=0;

		tryArray.pop();
		tryArray.pop();
		tryArray.pop();
		tryArray.pop();
		tryArray.pop();
	}


	function youWin() {
		whichBeaker=1;
		if (thisLevel<=3) {

			thisLevel++;
			sol1=Math.ceil(Math.random()*7);
			sol2=Math.ceil(Math.random()*7);
			sol3=Math.ceil(Math.random()*7);
			sol4=Math.ceil(Math.random()*7);
			sol5=Math.ceil(Math.random()*7);
			solArray.pop();
			solArray.pop();
			solArray.pop();
			solArray.pop();
			solArray.pop();
			solArray.push(sol1, sol2, sol3, sol4, sol5);
			trace(sol1+", "+sol2+", "+sol3+", "+sol4+", "+sol5);
			nextLevel_btn.visible=true;
			nextLevel_btn.addEventListener(MouseEvent.CLICK, goNext);
		}
		if (thisLevel==4) {
			trace("you won");
			joe_mc.visible=true;
			joe_mc.lEye.gotoAndStop("happy");
			joe_mc.rEye.gotoAndStop("happy");
			bubble_mc.visible=true;
			help_mc.visible=false;

			setChildIndex(bubble_mc, numChildren -1 );
			setChildIndex(joe_mc, numChildren -1 );
			bubble_mc.gotoAndStop("youWon");
			setChildIndex(close_btn, numChildren -1 );
			setChildIndex(replay_btn, numChildren -1 );
			sol1=Math.ceil(Math.random()*7);
			sol2=Math.ceil(Math.random()*7);
			sol3=Math.ceil(Math.random()*7);
			sol4=Math.ceil(Math.random()*7);
			sol5=Math.ceil(Math.random()*7);
			solArray.pop();
			solArray.pop();
			solArray.pop();
			solArray.pop();
			solArray.pop();
			solArray.push(sol1, sol2, sol3, sol4, sol5);
			trace(sol1+", "+sol2+", "+sol3+", "+sol4+", "+sol5);
		}
	}

	function youLose() {
		whichBeaker=1;
		trace("you lose");
		joe_mc.visible=true;
		bubble_mc.visible=true;
		help_mc.visible=false;
```

```
		setChildIndex(bubble_mc, numChildren -1 );
		setChildIndex(joe_mc, numChildren -1 );
		bubble_mc.gotoAndStop("youLost");
		setChildIndex(close_btn, numChildren -1 );
		setChildIndex(replay_btn, numChildren -1 );
}

bubble_mc.addEventListener(MouseEvent.CLICK, startGame);

function startGame(e:MouseEvent) {
		bubble_mc.visible=false;
		joe_mc.visible=false;
		help_mc.visible=true;
		bubble_mc.removeEventListener(MouseEvent.CLICK, startGame);
		help_mc.addEventListener(MouseEvent.CLICK, helpMe);
}


function goNext(e:MouseEvent) {
		trace("my level is "+thisLevel);
		whatLevel.nextFrame();
		nextLevel_btn.removeEventListener(MouseEvent.CLICK, goNext);
		nextLevel_btn.visible=false;
		bubble_mc.gotoAndStop(1);
		dishArray.push(dish1_mc, dish2_mc, dish3_mc, dish4_mc, dish5_mc);
		bg_mc.gotoAndStop(1);
		bg_mc.ins_mc.gotoAndStop(1);
		tube1Check=1;
		tube2Check=1;
		tube3Check=1;
		tube4Check=1;
		tube5Check=1;
		tube1_mc.gotoAndStop(1);
		tube2_mc.gotoAndStop(1);
		tube3_mc.gotoAndStop(1);
		tube4_mc.gotoAndStop(1);
		tube5_mc.gotoAndStop(1);
		bubble_mc.gotoAndStop(1);
		for (var tube2:int = 1; tube2<= 5; tube2++) {
			this["tube"+tube2+"_mc"].visible=false;
		}
		whichBeaker=1;
		resetArray();
		bubble_mc.visible=false;
		close_btn.visible=false;
		replay_btn.visible=false;
		joe_mc.visible=false;
		help_mc.visible=true;
		help_mc.addEventListener(MouseEvent.CLICK, helpMe);
		am1_txt.text=String("0");
		am2_txt.text=String("0");
		am3_txt.text=String("0");
		am4_txt.text=String("0");
		am5_txt.text=String("0");
		am6_txt.text=String("0");
		am7_txt.text=String("0");
		color1_mc.gotoAndStop(1);
		color2_mc.gotoAndStop(1);
		color3_mc.gotoAndStop(1);
		color4_mc.gotoAndStop(1);
		color5_mc.gotoAndStop(1);
		color6_mc.gotoAndStop(1);
		color7_mc.gotoAndStop(1);
		initializeCells();
		scShot=0;
		hShot=0;
```

```
		gShot=0;
		liShot=0;
		lShot=0;
		vShot=0;
		bShot=0;
		shot1=0;
		shot2=0;
		shot3=0;
		shot4=0;
		shot5=0;
		shot6=0;
		shot7=0;
		setOrig();
		joe_mc.lEye.gotoAndStop(1);
		joe_mc.rEye.gotoAndStop(1);
}

replay_btn.addEventListener(MouseEvent.CLICK, playAgain);
function playAgain(e:MouseEvent) {
		bubble_mc.gotoAndStop(1);
		dishArray.push(dish1_mc, dish2_mc, dish3_mc, dish4_mc, dish5_mc);
		nextLevel_btn.removeEventListener(MouseEvent.CLICK, goNext);
		nextLevel_btn.visible=false;
		bg_mc.gotoAndStop(1);
		bg_mc.ins_mc.gotoAndStop(1);
		tube1Check=1;
		tube2Check=1;
		tube3Check=1;
		tube4Check=1;
		tube5Check=1;
		tube1_mc.gotoAndStop(1);
		tube2_mc.gotoAndStop(1);
		tube3_mc.gotoAndStop(1);
		tube4_mc.gotoAndStop(1);
		tube5_mc.gotoAndStop(1);
		bubble_mc.gotoAndStop(1);
		for (var tube2:int = 1; tube2<= 5; tube2++) {
			this["tube"+tube2+"_mc"].visible=false;
		}
		whichBeaker=1;
		resetArray();
		bubble_mc.visible=false;
		close_btn.visible=false;
		replay_btn.visible=false;
		joe_mc.visible=false;
		help_mc.visible=true;
		help_mc.addEventListener(MouseEvent.CLICK, helpMe);
		am1_txt.text=String("0");
		am2_txt.text=String("0");
		am3_txt.text=String("0");
		am4_txt.text=String("0");
		am5_txt.text=String("0");
		am6_txt.text=String("0");
		am7_txt.text=String("0");
		color1_mc.gotoAndStop(1);
		color2_mc.gotoAndStop(1);
		color3_mc.gotoAndStop(1);
		color4_mc.gotoAndStop(1);
		color5_mc.gotoAndStop(1);
		color6_mc.gotoAndStop(1);
		color7_mc.gotoAndStop(1);
		initializeCells();
		scShot=0;
		hShot=0;
		gShot=0;
		liShot=0;
```

```
	lShot=0;
	vShot=0;
	bShot=0;
	shot1=0;
	shot2=0;
	shot3=0;
	shot4=0;
	shot5=0;
	shot6=0;
	shot7=0;
	setOrig();
	joe_mc.lEye.gotoAndStop(1);
	joe_mc.rEye.gotoAndStop(1);
	thisLevel=1;
}

function setOrig() {
	sc1_mc.x=origX1;
	sc1_mc.y=origY1;
	sc2_mc.x=origX2;
	sc2_mc.y=origY2;
	sc3_mc.x=origX3;
	sc3_mc.y=origY3;
	sc4_mc.x=origX4;
	sc4_mc.y=origY4;
	g1_mc.x=origX8;
	g1_mc.y=origY8;
	l1_mc.x=origX10;
	l1_mc.y=origY10;
	b1_mc.x=origX11;
	b1_mc.y=origY11;
	li1_mc.x=origX12;
	li1_mc.y=origY12;
	v1_mc.x=origX13;
	v1_mc.y=origY13;
	h1_mc.x=origX15;
	h1_mc.y=origY15;

}

function helpMe(e:MouseEvent) {
	help_mc.visible=false;
	help_mc.removeEventListener(MouseEvent.CLICK, helpMe);
	bubble_mc.visible=true;
	joe_mc.visible=true;
	bubble_mc.addEventListener(MouseEvent.CLICK, closeHelp);
	if (bubble_mc.currentFrame==1) {
		bubble_mc.demo.gotoAndPlay(1);
	}
	if (bubble_mc.currentFrame==5) {
		bubble_mc.demo.gotoAndPlay(1);
	}
	setChildIndex(bubble_mc, numChildren - 1);
	setChildIndex(joe_mc, numChildren - 1);
}

function closeHelp(e:MouseEvent) {
	bubble_mc.visible=false;
	joe_mc.visible=false;
	help_mc.visible=true;
	help_mc.addEventListener(MouseEvent.CLICK, helpMe);
	bubble_mc.removeEventListener(MouseEvent.CLICK, closeHelp);
}

close_btn.addEventListener(MouseEvent.CLICK, return2Scene);
function return2Scene(e:MouseEvent) {
```

```
        MovieClip(parent.parent).goBack2();
        MovieClip(parent.parent).removeChild(MovieClip(parent.parent).mainLoader);

    }
```

6.3 STEM CELL SURVEY:

Known Info **Exit this survey**

1. Default Section

1. Please give me some background information. This will only be used for usability testing and will not be published. Please provide at least your email if you are willing to participate in further research for my thesis.

Name:

Gender:

Age:

Country:

Email Address:

✱2. What field do you work or study in? (design, engineering, etc...)

✱3. I say "stem cell" and your immediate reaction is:

✱4. How much do you know about stem cells right now?

- Nothing
- I've heard of them...
- A little
- Enough to discuss them
- I've studied stem cells in school
- I work with stem cells

✱5. Do you want to know more about stem cells?

- Yes
- No

✱6. Check the terms you have heard before.

- embryonic stem cells
- pluriopotent stem cells
- induced pluriopotent stem cells
- none of the above

✱7. Do you play games online?

- Yes
- No

✱8. Do you do research online?

- Yes
- No

Done

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