Ready, Set, Go: A Kinderactive CD ROM Series

By

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Abstract

*Ready, Set, Go: A Kinderactive CD ROM Series* is an interactive, multimedia based way to assist preschoolers and their parents in making the transition to Kindergarten. Proper preparation and parental involvement in a young child’s life before they attend kindergarten has proven to be a determining factor in that child’s academic success and overall well being. This particular multimedia application is designed in an effort to inform and include the parents in a type of application that has primarily been designed with only the child in mind. This is an application in which the parent and child will benefit equally. The application which is developed in Macromedia Flash MX has useful information, a user friendly interface, and personalized interactive activities for the child to build skills that will ensure academic success.
Ready, Set, Go: A Kinderactive CD ROM Series

1. Statement of the Problem

1.1 Definition of Need

At the beginning of the 2004-2005 school year, millions of children ages 4-6 will enter kindergarten in America for the first time. Among those who will enter, 40% will not be fully prepared or “ready” for school (1). It has been determined that this lack of readiness is a direct result of insufficient early childhood education in the areas of cognitive, social, emotional, and physical well being. For example, most first-time kindergartners can recognize some single-digit numerals, identify simple geometric figures, and count to 10. However, thirty-four percent cannot identify letters of the alphabet by name. Forty-two percent cannot count 20 objects (5). This deficiency is not limited to children who attend preschools but also includes children who are in day care centers, home day cares, and those who are cared for solely by parents. In Colorado a state-wide survey was conducted among 1,000 teachers. The majority of the teachers surveyed felt that a significant number of the students they teach are ill prepared to begin school. They reported that four-out-of-ten kindergarten students do not have the ability to recognize the difference between numbers and letters. Other skills that students lack according to these teachers are to recognize one’s own name in print, count to 20, and draw basic shapes. These are skills that teachers feel are very important and should be developed before entering school.

Kindergarten readiness is important subject in education because many believe that being prepared for kindergarten establishes a foundation for success throughout a child’s academic career. It has been proven through various studies that students who are
prepared for kindergarten are more likely to perform better in later grades and throughout life.

**Computers and Young Children**

Many of the skills deficiencies noted above can be developed without the use of a computer. However, in the information age, computers are becoming more prevalent both in the home and in schools. “More children are being introduced to computers than ever before evidenced by the fact that in 2000 65 percent of children had access to a home computer, compared with 32 percent in 1993” (2). In a study conducted in 1999 by the U.S. Department of Education, almost all public school teachers (99 percent) indicated that computers were available in their schools”(4). Computers are no longer just a tool for entertainment and business but for learning also. Being a parent of both a toddler and a preschooler I have personally observed the interest and curiosity that young children have in computers and the capabilities that they display in using them.

2. **Description of the Solution**

To help address the need for kindergarten preparedness I designed and developed a two disk interactive multimedia CD ROM Series using Macromedia Flash that educates parents/caregivers in assisting their child in making the transition to kindergarten and helps children to develop skills that will improve academic success in kindergarten.

These objectives are achieved by having one disk for the parent and one disk for the child. The CD for parents is intended to be used as a source of information.

The disk for parents includes:

- Answers to frequently asked questions parents have concerning the kindergarten experience
• Printable Lesson Plans and Activities in the four key areas of development (cognitive, social, emotional, and physical) that parents can do with the child
• Information on the features in the CD for children and Instructions on how to use it
• Information about the Kindergarten experience
• Additional Resources in which parents can use to prepare their child for kindergarten.

The disk for children includes:

• A parent assessment to determine areas of development with which the child needs help.
• A story which addresses concerns that a child may have about kindergarten.
• Interactive activities in the key areas of development.

The games, activities ideas, and printable worksheets are focused on the four key areas outlined below.

• **Cognitive**
  
  - Recognizing Letters and Numbers
  - Counting to double digit numbers
  - Recognizing common words
  - Spatial awareness
  - Associating Sounds with Letters
  - Lower Case vs. Upper Case Letter

• **Social/Emotional**
  
  - Sharing
  - Manners
  - Interacting with others
  - Following directions

• **General Knowledge**
  
  - Knowing full name
  - Address
  - Names of all immediate Family Members
  - Birthday
  - Seasons
o Days of the Week

• Physical (Self-help Skills)
  o Dressing
  o Eating
  o Handwashing

2.1 User Profile

There are two targeted user types: Children and their parents/caregivers.

Children

These users are three and five years of age. They may or may not be enrolled in an early childhood education program. They have limited skills in using a mouse (such as clicking objects on the screen) and keyboard and vary in academic skills (i.e. reading) and knowledge.

Parents/Caregivers

These users include all age ranges and genders as long as they the Parents/Caregivers. This category could include other people who have an interest in preparing a child for kindergarten. These users also have varying levels of Information Technology Literacy from basic to advanced. I am assuming that these users have some prior computer skills such as putting in a disk, using the mouse, and selecting options. I also expect users to have varying backgrounds and educational levels.

2.2 Design Protocols

Organizational Scheme

The overall organizational scheme is based on a design for a two disk application. This is designed in such a way that the content is divided by user type. This is beneficial because a child using the product can focus on the content directed to him/her without confusion.
Each disk is organized into topics. The Parent/Caregiver disk is organized into the following areas (See Appendix A):

- **Making the Transition**: this section provides information on how to prepare the weeks and months before school starts, enrolling a child for kindergarten, what to expect on the first day of school, and tips to follow after school starts.
- **Frequently Asked Questions**: this section presents questions and answers typically asked by parents about kindergarten.
- **Preparation for Kindergarten**: this section has printable lesson plans that can be completed by the parent and child in the four key areas of child development.
- **How to Use Child CD**: this section explains the features of the CD and explains each area of the child CD in detail. It also provides tips on getting maximum usage.
- **Additional Resources**: this section provides additional worksheets, books, and Web sites that can be used to prepare for kindergarten.

The CD for children is organized into the following subject areas (See Appendix B):

- **When I go to Kindergarten**: this section provides an interactive look into what happens in kindergarten.
- **Learning**: this section provides interactive activities in the area of cognitive development such as number and letter recognition.
- **All About Me**: this section provides activities in the area of self-knowledge. Activities in this area help the child learn their full name, age, address phone number, and names of immediate family members.
- **Exploring**: this section provides interactive activities that will help the child learn about the concepts they need to know about the world around them. This area includes activities that will help them learn the days of week and seasons.

Another important feature of the CD for children is an interactive parent assessment that will enable parents to measure their child’s current knowledge. It will then direct them to areas in both CDs from which the child will benefit. (See Figure 1.)
The interface design is simple, visually appealing and user friendly. The interface is 800 x 600 pixels. The active area of the application is 800 x 550 pixels. The remaining 50 pixels are reserved for the universal buttons (see Icons/Graphic Symbols which are located at the bottom of the screen (See Figure 4.). The navigation buttons for the individual activities are highly recognizable throughout the application.

The navigation design is also theme-based. It is divided among specific subject areas/areas of development. Each area has a color associated with it for easy navigation.
The CD for parents is also designed to be user friendly and intuitive. It is consistent with the look of the CD for children. It is also 800 x 600 pixels. The navigation system is slightly more advanced in comparison to the CD for Children. It consists of intuitive rollover buttons which combine text and graphics and is located at the bottom of the screen.
Figure 3. Main Menu screen for Parent Guide

Icons/Graphical Symbols

The icons shown in Figure 4. are used throughout the application. These are the universal function icons that are located at the bottom of each of the pages in the application other than the main menu.

Figure 4. Universal Buttons
Color Scheme

For my application I have chosen a color scheme that reflects the colors in the color wheel: red, blue, green, yellow, orange and purple. This color scheme is used for both CDs. So that these basic colors don’t overwhelm the user different hues and tints of these colors are used as well. Brown is also an accent color that is used throughout the applications to create a sense of consistency.

Each section in the CD for children has a signature color that is associated with it. This gives the user a sense of where they are located within the application. The color associations are:

Orange-When I go to Kindergarten
Purple-Learning
Red-All about me
Green-Exploring

Help

The application includes a help module that is presented to the user as a pop up in the middle of the screen at any point that the user designates in the application. The pop up will then list all of the help topics relevant to the execution of the application.

3. Deliverables

In order to achieve the objectives of the project certain items were determined to be necessary for a satisfactory, high quality project. These items were identified during the design phase of the project.

- A parent module that provides useful information and resources on the transition to kindergarten.
• A child module that provides interactive activities to assist children in building skills and knowledge that will help them be successful in kindergarten.

• Printable activity ideas for parents to use with their child.

• A minimum of 12 interactive activities produced in Flash MX which will be focused in the four key areas of development.

• A parent assessment which will allow parents to evaluate their child’s initial degree of development and direct them to resources within the application that will benefit them.

4. Design and Development

The next sections describe the project’s timeline for completion and the budget, which includes the cost for the hardware and software necessary to produce the application.

4.1 Timeline

The time needed to complete the development phase of the project is shown in Gantt chart in Appendix C. It defines a time period between December 4, 2003 and June 3, 2004. It includes the design, development, and testing phases of the production and it breaks the development of the CDs into modules according to the focus areas of the content.

4.2 Budget

The budget for this project is presented in Figure 5. The budget was created by determining the development costs of the project and excludes the costs of labor, packaging and CD duplication. The prices for the software were compiled from the manufacturers’ Web sites in addition to cdw.com. The hardware prices were collected
from Dell Computers. The budget was reduced from the initial estimate due to several decisions. The primary change in budget is due to the decision to use Macromedia Flash as the primary authoring tool. The budget was also reduced due to the decision to eliminate the need for a digital video camera by using screen captures and additional Flash animations. Microsoft Producer was used for the screen captures. Since Producer is available free to licensed users of Powerpoint 2002 and 2003 no additional costs were accrued. The decision was also made to use Goldwave 5.07 instead of Sonic Foundry Acid Pro 4.0. This proved to be a wise decision. The new version of Goldwave is much easier to use and has improved from its previous versions.
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**Budget Total** | $2880.98

**Figure 5. Updated Project Budget**

5. **Proof of Design**

The next section provides a detailed analysis of how the project deliverables were fulfilled and the challenges that were encountered.

5.1 **Disk One – Parent Guide**

The next seven sections provide a detailed analysis of the information and modules that make up the Parent CD.
5.1.1 Flash Introduction

A visually appealing Flash introduction welcomes the user to CD. It consists of a letter that summarizes what the CD has to offer. After reading the letter the user can then click the *Go* button to navigate to the main menu of the CD.

![Flash Introduction Screenshot](image)

**Figure 6. Parent CD Splash Screen**

5.1.2 Analysis of Five Main Sections

This section analyzes the five main sections of information contained on this CD.

5.1.2.1 Making the Transition

The Making the Transition section gives good information about things that affect a parent and child before school starts. This section is broken down into five subsections (See Figure 7.)

- First Steps
- Enrolling
- Before the First Day
- The First Day
- Helpful Tips
The First Steps subsection gives information about how to choose a school. It gives ideas and questions that parents should consider and ask themselves while they are exploring different school options. The Enrolling subsection gives parents a list of the common requirements that must be met when registering a child for school. These include age, residency, and immunization requirements. It also has a short list of documents that a parent should have available when enrolling their child for school such as a birth certificate, immunization record, and social security card. The Before the First Day subsection gives the parent ideas on goals that they should set before school begins. These goals include encouraging independence, establishing daily routines, and discussing concerns about school. The next subsection, The First Day gives parents of list of things that they can do with their child to make his/her first day of school comfortable and memorable. The final subsection of Making the Transition, Helpful Tips, gives additional information about what a parent can do to stay involved with their child’s education after school starts.
5.1.2.2 Frequently Asked Questions

Once the user selects the Frequently Asked Questions link from the home screen of the application, he/she is taken to the Frequently Asked Questions home page (See Figure 8). A brief introduction to the section is provided as well as ten questions that are commonly asked regarding kindergarten. Each question is a linked page which restates the question and provides an answer. (See Figure 9.)

![Figure 8. Frequently Asked Questions Home Page](image1)

![Figure 9. Frequently Asked Question Page](image2)
5.1.2.3 Printable Activity Ideas

The printable activity ideas are contained in the *Preparing Your Child* section of the CD. This section consists of 20 lessons plans that parents can print and complete with their child. There are 5 lessons plans for each development category. The development categories are Cognitive, Social/Emotional, Physical, and Language. Each lesson plan sheet includes the objective of the lesson plan, materials required (if any), and detailed instructions on how to complete the activity (See Figure 10.). Once the user clicks on the print button the printer dialog box automatically appears and detects the installed default printer. The user can modify the number of copies desired and print the document. The print and close buttons do not appear on the printed copy. Once the document has been printed the user can click the close button on the sheet and return to the *Preparing Your Child* home page. (See Figure 11)

Figure 10. Printable Lesson Plan
5.1.2.4 How to Use the Child CD

This section of the Parent module summarizes the objectives and contents of each of the three main sections on the child CD. It gives a brief explanation and screen shot of each section and it also explains the skills that the child can build by using each section and whether the child should be able to complete the activities in the section without help from an adult. (See Figure 12.) The How to Use Child CD section also explains the navigation on the Child CD.
5.1.2.5 Additional Resources

The Additional Resources Section of this CD has three subsections of resources from which parents can choose. These are Web Sites, books, and worksheets. (See Figure 13.)
Once the user chooses the Web Site link in this section the user navigates to a page where he/she is given a list of Web Sites that have useful information and activities for their child to be engaged in. When the user chooses the books link in this section, the user is taken to a page that lists children’s books that have content dealing specifically with young children starting school for the first time. (See Figure 14.) If the user chooses the worksheet section he/she is taken to a page of links to worksheets that he/she can print out for their child to complete. There are eight worksheets that focus on concepts such as handwriting, shape recognition, and math readiness. (See Figure 15.)

![Additional Resources - Books Page](Image)

**Figure 14. Additional Resources - Books Page**
The second disk in this project contains three main components: a parent assessment, twelve interactive activities, and a story that addresses concerns and questions that a child may have about kindergarten.

### 5.2.1 Flash Introduction

The first screen that the user will see when he/she opens this CD is a visually appealing animation of two children boarding a school bus. The user can then click on the go button to navigate to the main screen of the application. The screen shot of the main screen mentioned is described and displayed in the Design Protocols section. (See Figure 2.)

### 5.2.2 Parent Assessment

The link to the parent assessment appears on the main screen of the Child CD. This section contains nine questions for parents to answer. These questions help parents assess their child’s current level of development. The questions are geared towards the
concepts that are presented in this application. Depending on the parents’ answer to a certain question they may be referred to an area of the CD to assist in their child’s skill improvement or they may be referred to an outside source. At the beginning of the parent assessment there is an introduction page that gives instructions on how to proceed through the assessment. There is also a summary page that signals the end of the assessment and allows the user to return to the main screen of the application.

5.2.3 Four Main Sections

The four main sections of this CD include the story, *When I go to Kindergarten*, *Learning*, *All About Me*, and *Exploring* Sections which will be explained in detail below.

5.2.4 Analysis of Interactive Activities

The next sections describe the 12 interactive activities that are available on the CD.

5.2.4.1 The Alphabet

This activity is the first activity that appears on the Learning Section home page. The objective of this activity is to build letter recognition skills. When the child clicks on the play button a menu appears. (See Figure 16.) The menu consists of all of the letters of the alphabet.
Figure 16. Alphabet Activity Menu Screen

When the child rolls over a letter the scale of the letter increases and the letter is said. When the child clicks on the alphabet the child gets a screen with the letter (both lowercase and uppercase) and the child can see a graphic or an animation of something that starts with that letter. (See Figure 17.) Certain letters also have added interaction where the child can invoke an action such as static on a television or changing ice cream flavors. When the child is ready to view another letter he/she can press the back button to return to the alphabet menu.
5.2.4.2 The Number Game

The number game builds number recognition and counting skills up to twenty.

This activity lets the child choose through a menu of numbers. (See Figure 18.)
When the child clicks on a number button the number of apples that corresponds to that number appears and is counted. When the child chooses the number game button from the main number game menu a random number of apples appears on the left side of the screen and the child is asked to choose from a selection of three numbers on the right (similar to a multiple choice scenario). (See Figure 19.) When the child makes the correct choice, he/she gets a positive feedback screen. If the child does not make the correct choice he/she is told to “try again” and is given the opportunity to choose the correct answer.

![Number Game Screen](image)

**Figure 19. Number Game Screen**

### 5.2.4.3 Me, Myself, and I

This activity teaches a child to recognize his/her name and address. Upon entering the activity, the child is alerted that he/she will need a parent to assist with this activity. The parent is then required to fill out a form with the child’s first name, last name, and address including city, state, and zip code. The scenario of this activity is that the child has a letter and needs to get it out of the mailbox which he or she can do by press the picture of the mailbox on the screen. (See Figure 20.) The letter that the child gets has
his/her name and address on it. The next three screens have questions that the child must answer in order to see the contents of the letter such as “What does your name start with? Can you press all of the letters in your name?” The child can then type in and check the answers. (See Figure 21.) At the end of this activity when they successfully answer all of the questions he/she can read and hear the contents of the letter which is from the mailman wishing him/her luck in kindergarten.

Figure 20. Me, Myself, and I Activity Screen

Figure 21. Me, Myself, and I Activity-Question Screen
5.2.4.4 The Telephone Game

The objective of this activity is to teach a child his/her home phone number. Upon entering the activity, the child is alerted that he/she will need a parent to assist with this activity. The next screen allows the parent to enter their child’s home phone number. (See Figure 22.)

![Figure 22. Telephone Game Data Entry Screen](image)

Their phone number appears and he/she can practice it by dialing the telephone on the screen. (See Figure 23) Once he/she have entered it they can check it to see if he/she is correct. If he/she is correct a phone different in color from the one that they used to enter his/her phone number rings and a sound saying “Good Job” is played. He/she then has an opportunity to go back to the main screen and enter the phone number without the help of seeing it in front of them. If they get it right they get a reward screen. If they are incorrect get it right they are encouraged to try again.
5.2.4.5 The Four Seasons

This activity teaches the child about the four seasons. When the child presses the play button he/she gets a screen that explains that every year there are four seasons. Then there are four screens that introduce each season. The child is then taken to a menu of seasons. (See Figure 24.)
When the child rolls over the season, the name of the season appears. When a child clicks on the season he/she is taken to a screen that narrates important characteristics of the season. The child can then explore the season and click on things and the object might animate. (See Figure 25.) Once the child is done exploring a particular season he/she can easily navigate back to the Seasons menu by pressing the back button in the upper right hand corner.

![Season Activity Screen - Fall](image)

**Figure 25. Season Activity Screen - Fall**

### 5.2.4.6 Days of the Week

This activity was developed to give children the opportunity to learn and recognize the days of the week. This is done through two smaller activities. When the child enters the application he/she is given a menu in which he/she can choose the *Play a Song* activity or the *My Calendar* activity. (See Figure 26.)
The *Play a Song* activity has a jukebox where the child can choose a song about the days of the week. There are three songs; “My Days of the Week”, “There are Seven Days”, and “Twinkle, Twinkle, Days of the Week.” The song starts when the child presses one of red buttons on the jukebox. When the child chooses the *My Calendar* activity he/she is taken to the *My Calendar* activity screen. The child can then use a calendar to drag activities to individual days (e.g. “Go to School” graphic can be dragged to a Monday). When the child drags an activity on a certain day a sound that says the name of the day is played. (See Figure 27.)
5.2.4.7 Family Members Recognition

This activity teaches the child to recognize the names of his/her immediate family members. Upon entering the activity, the child is alerted that he/she will need a parent to assist with this activity. This screen is common in all of the activities that require data entry. (See Figure 28.) The parents can then fill put a form that accepts the names and relationships of up to five family members (See Figure 29.). The scenario is a picture book. Each “page” has a Polaroid picture of a family member with their name at the bottom. Flash tells the child whose name it is and what their name starts with. The child is asked to draw a picture of that person inside the Polaroid picture, which is a drawing board.(See Figure 30.)
Figure 28. Adult Assistance Screen

Figure 29. Family Album Activity Data Entry Screen
5.2.4.8 The Birthday Party

This activity teaches the child about his/her age with a birthday party. Upon entering the activity, the child is alerted that he/she will need a parent to assist with this activity. The parent enters the age of the child. The child is then shown how old he/she is by the actual number appearing and a hand showing and counting the appropriate number of fingers. (See Figure 31.)
The child is then asked to put the appropriate number of candles for his/her age on a birthday cake. (See Figure 32.) The child can then decorate a room (as if for a birthday party). The final screen asks the child to choose the number that represents the age that he/she will be on his/her next birthday. Once he/she gets the correct answer he/she has the option to go through the activity again.

Figure 32. Birthday Party Activity Screen

5.2.4.9 Snacks

This activity is comprised of three components. When the child opens this activity, a menu appears giving two activity options. (See Figure 33.) The child can choose to learn about foods or play games. If the child chooses to learn about foods he/she is taken to a narration that explains that there are five food groups. The child can navigate to the next screen by clicking the next button. A sound of each food group is played and the child can roll over the foods in each food group category to reveal the name of a particular food. (See Figure 34.) At the end of the narration the child can return to the activity choice menu.
If the child chooses to play games he/she is taken to a menu that has two more options. A choice is given between the Healthy Foods activity and the Make a Salad activity. The Healthy Foods activity consists of one screen that displays a grocery bag surrounded by different foods both health and unhealthy. The child can then click and drag each food to the grocery bag. If the food is a healthy food a happy face appears on
the bag. If the food that is dragged to the bag is unhealthy, the bag displays a sad face. If
the child chooses the *Make a Salad* activity he/she is taken to a screen that displays a
bowl surrounded by vegetables. (See Figure 35.) When the child clicks on a vegetable, the
vegetable falls into the bowl. Once all of the vegetables are in the bowl the child can print
a salad recipe to make with their parent. This promotes healthy eating.

![Figure 35. Make a Salad Activity Screen](image)

**5.2.4.10 Getting Dressed**

This activity teaches children about articles of clothing and dressing for
the appropriate occasion. When the child enters this activity he/she is taken to
menu screen where he/she has three opportunities to gain more knowledge about
clothing. The main menu screen has four articles of clothing on it. When the child
rolls over the item the name of the article of clothing is revealed. When the child
clicks on the article of clothing a sound with the name of the piece of clothing is
played. The main menu screen also contains two activity choices, *Let’s Get
Dressed* and *Where does this Belong?* (See Figure 36.)
When the child chooses the *Let's Get Dressed* game he/she is provided with instructions on how to play the game. The objective of the activity is to look at the window. The window graphic indicates the weather outside. The child is then asked to choose between the two outfits on the right side of the screen. Once the child chooses the appropriate outfit he/she can click and drag the outfit onto the child. (See Figure 37.) If the child chooses the correct outfit the outfit covers the graphic of the little girl and the next button appears for the child to continue to the next screen. If the child picks the incorrect outfit the outfit returns to its original position. There are a total of four different outfits. At the end of the activity the child is given the option to complete this activity again or return to the main menu.
When the child chooses the *Where Does This Belong?* activity he/she is taken to a screen that displays an article of clothing in the middle of the screen. The instructions for the activity appear at the top of the screen. A menu of body part choices appear at the bottom of the screen. (See Figure 38.) The child can then click on the body part on which the article of clothing belongs. When the child clicks on the incorrect body part, he/she is prompted to try again. When the child chooses the correct body part the child hears a sound that says “Good Job” and he/she is taken to the next screen. There are a total of five different articles of clothing that the child must match with the appropriate body part.
5.2.4.11 Hand Washing

When the child enters this activity a narration about why hand washing is important is presented. The child is told when he/she should wash his/her hands. The concept of germs is briefly explained. (See Figure 39.)
A screen of a bathroom is set up so the child can virtual “wash his/her hands” The mouse cursor is a hand. If the child rolls the mouse over the soap, the soap begins to bubble, The child can turn on the faucet and water comes out, then the child can roll over the towel and the towel changes color to simulate friction as if the hands dry off on the towel. A voice gives step by step instructions (i.e., “First turn on the water, then pick up the soap…”). (See Figure 40.)

![Figure 40. Clean and Shiny Hands Activity – Bathroom Scene](image)

5.2.4.12 Uppercase Letters vs. Lowercase Letters

This activity consists of a matching game in which the child can match lowercase letters with uppercase letters. When the child enters this activity he/she is given instructions to match the uppercase letters with the lowercase letters. (See Figure 40.) The child can roll the mouse over the instructions to see examples of what a lowercase letter looks likes and what an uppercase letter looks like. This screen also contains an embedded video of a screen capture in which the letters are being match. The video loops until the child clicks the next button to navigate to the next screen.
The first five letters of the alphabet appear as buttons at the top of the screen in uppercase form. On the bottom of the screen are the lowercase forms. The child can then click and drag the lowercase letters on top of the uppercase letter that matches. (See Figure 42.) When the child makes a match, the lowercase letter positions itself in the middle of the uppercase letter. Then a rewarding sound that says, “You’ve got a match” is played. As a reinforcement, the letters that were matched both uppercase and lowercase appear together under the matched letters. If the child makes an incorrect guess the lowercase letter returns to its original position. Once all five of the letters have been matched the user can navigate to the next set of letters. The child can continue matching letters in sets of five until he/she has reached the end of the alphabet. Then the child can choose to complete the activity again.
Figure 42. Case Letters Activity Screen

5.3 When I go to Kindergarten

This activity is a story that can be read to the child or the child can listen to alone. It discusses the things that happen on the first day of school. It addresses concerns that the child may have. After the child hears the narration he/she can click the next button to go to the next screen. If he/she would like to go to the previous screen, he/she can click the back button. (See Figure 43.)
6. Testing Procedures

Testing was a necessary and ongoing step in the development process. Several testing methods were used to ensure that the project exemplified good quality and functionality. Since the project was divided into sections early in the design phase, each section was developed as a separate entity and seamlessly integrated into the user interface. The unit testing technique was used to make sure that all of the sections were functional before integrating the components. Once all of the modules were integrated, a complete system test was done to check for logical errors, syntax errors, and other minor inconsistencies.

One advantage of this project was that a user that matched the primary user profile (preschooler) was available during ninety percent of the project’s development and implementation phase. This often saved time and avoided the need to arrange outside user testing. This proved to be a valuable asset. When a module was completed feedback was received almost instantly. This also helped in ensuring that the user requirements were being met. In some cases this also provided for the use of rapid prototyping. Since
the project was not developed by an expert in the field of early childhood education
having the ability to observe and interview the primary user on a constant basis reduced
errors in the conceptual aspects of the project.

An unexpected opportunity for user testing occurred at the College of Applied
Science 2004 Tech Expo. While displaying the project, several parents and preschool age
children tested the project and provided feedback. One child that used the product did not
want to leave the booth to view the other displays. Not only was there direct feedback but
also the opportunity to observe the interaction between parent and child. This was very
important since the project proposed to have an increased amount of parental
involvement in the application. Parents, children, and grandparents were pleased with the
project and many were anxious for the project to be distributed commercially. They were
satisfied with the content, concepts, and choice of implementation. The suggestions that
were made regarding the improvement of the project were addressed in the final
implementation of the project. For example, a few of the children had trouble clicking
some of the textual buttons because of the small hit area. To correct this problem, a
transparent layer or graphic was placed behind the text in the button to make the button’s
hit area larger. The most popular game at the Tech Expo was *The Alphabet Game*. The
children loved the animations and quickly learned how to navigate to each letter.

Further acceptance testing was conducted by peers to check for errors and
inconsistencies. The errors found were researched (if necessary) and corrected.

System testing was also an important part of the project. The modules were tested
on the following Microsoft operating systems: Windows 98, 2000, and Windows XP.
7. Conclusions and Recommendations

7.1 Conclusions

This project was created to educate parents/caregivers on assisting their child in making the transition to kindergarten. It was also developed to help children develop skills that will improve academic success in kindergarten. I created a visually appealing multimedia application full of information, resources, and activities. This two disk application is full of graphics, sounds, animations, and information. This project was developed using Macromedia Flash MX, Adobe Photoshop 7, Goldwave, and Microsoft Producer. The budget excluding labor costs, is an approximate estimate in a real world situation. The project fulfilled the project deliverables established in the Design Freeze. Unit testing and system testing was performed to ensure the project’s functionality and quality.

7.2 Recommendations

Developing and implementing this project was an enormous undertaking for one person. My hard work resulted in a quality project but several challenges were encountered along the way. The component of the project that proved to be most challenging was the sound. I found that producing a product for this particular group of users requires an extensive amount of sound. Unique vocals were needed that had to be recorded. While recording the vocals, difficulty was encountered in modifying the sound to get the professional quality and consistency needed for the project. Any project requiring an extensive amount of custom sounds should have the best equipment possible to eliminate the need to adjust the sound after it is recorded. The best equipment for recording would include a professional quality microphone that eliminates unwanted
environmental noise such as the hum of the computer fan. These professional quality microphones are costly but I think that it would be worth the investment. It would reduce the amount of effort put into refining the sounds. This effort could be used to more efficiently testing the project.
# Appendix C. Project Timeline

<table>
<thead>
<tr>
<th>Name</th>
<th>Start_Date</th>
<th>Finish_Date</th>
<th>Duration</th>
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<tr>
<td>Gather Content Materials</td>
<td>Thu 12/4/03</td>
<td>Fri 12/12/03</td>
<td>7 days</td>
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<tr>
<td>Design Navigation</td>
<td>Thu 12/11/03</td>
<td>Fri 12/19/03</td>
<td>7 days</td>
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<tr>
<td>Design Interface</td>
<td>Mon 12/22/03</td>
<td>Tue 12/30/03</td>
<td>7 days</td>
</tr>
<tr>
<td>Test Interface components on Audience</td>
<td>Mon 12/29/03</td>
<td>Wed 12/31/03</td>
<td>3 days</td>
</tr>
<tr>
<td>Create Interface Graphics</td>
<td>Thu 1/1/04</td>
<td>Wed 1/7/04</td>
<td>5 days</td>
</tr>
<tr>
<td>Develop Disk 1-Parent Caregiver Disk Skeleton</td>
<td>Tue 1/20/04</td>
<td>Mon 1/26/04</td>
<td>5 days</td>
</tr>
<tr>
<td>Develop Disk 2- Child Skeleton</td>
<td>Tue 1/27/04</td>
<td>Mon 2/9/04</td>
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</tr>
<tr>
<td>Complete Prototype and Design Freeze Document</td>
<td>Mon 2/9/04</td>
<td>Thu 3/11/04</td>
<td>24 days?</td>
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<tr>
<td>Present Design Freeze and Submit Documentation</td>
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<td>Thu 3/11/04</td>
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<tr>
<td>Complete Development of Game/Activity Set Learning</td>
<td>Thu 3/11/04</td>
<td>Fri 3/19/04</td>
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<td>Complete Development of Game/Activity Set All about me</td>
<td>Mon 3/15/04</td>
<td>Tue 3/30/04</td>
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<tr>
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<td>Incorporate Game Active Sets into Disk 2 Prototype</td>
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<td>Tue 4/27/04</td>
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<tr>
<td>Develop Assessment Module</td>
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<td>Thu 4/29/04</td>
<td>3 days</td>
</tr>
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<td>Internal Testing</td>
<td>Sat 5/1/04</td>
<td>Tue 5/4/04</td>
<td>3 days</td>
</tr>
<tr>
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<td>Thu 5/6/04</td>
<td>3 days?</td>
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<td>Tue 5/11/04</td>
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<td>Fri 5/21/04</td>
<td>2 days?</td>
</tr>
<tr>
<td>Final Presentation and submit Final Documentation</td>
<td>Thu 6/3/04</td>
<td>Thu 6/3/04</td>
<td>1 day?</td>
</tr>
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Appendix D.
Code Snippets

D 1. Number Game Code Snippet

When the number game loads, a random amount of apples is shown for the child to count. To the right of the screen are three button choices that are randomly placed and shuffled for the child to choose. This is done through actionscript. A Random number is produced to display the apples and is stored in the global variable _global.num. The apple graphics are displayed using the duplicateMoveClip() function. Once the apples are displayed an array is created to store and display the choices that the child can choose. The script uses the _global.num variable to get the correct choice movieClip. It is is then pushed into the array as the first element. Then two random choices are created and pushed into the array. The array checks to make sure that these choices do not match the correct choice. Once two unique choices are created, the array is sorted so that the correct answer always displayed in a different position. Then the choice buttons are displayed in specific positions using the attachMovie() command.

//declare random number to determine the number of apples displayed
_global.num = Math.floor(Math.Random()*20+1);

//declare first element in array and set it equal to the amount of apples displayed
var correct = num;

//declare the array of choices
choices = new Array();

//make correct number of apples the first element in the array
choices.push(correct);

//make the next two elements of the array between 1 and 10, 10-20 respectively
//make the first choice different from the correct choice
var firstrand = Math.floor(Math.random()*10+1);
if (firstrand == choices[0]) {


choices.push(++firstrand);
} else {
    choices.push(firstrand);
}

// make the second choice different from the correct choice
var secondrand = Math.floor(Math.random()*11+10);
if (secondrand == choices[0]) {
    choices.push(++secondrand);
} else {
    choices.push(secondrand);
}

// sort the array so that the buttons are in a different order each time
choices.sort();
choice1 = choices[0];
choice2 = choices[1];
choice3 = choices[2];

// attach choice button
attachMovie(choice1, "guess1", 21);
guess1._x = 700;
guess1._y = 100;
attachMovie(choice2, "guess2", 22);
guess2._x = 700;
guess2._y = 250;
attachMovie(choice3, "guess3", 11);
guess3._x = 700;
guess3._y = 400;
stop();

**D 2. Uppercase Letter vs. Lowercase Letter Code Snippet**

The code below uses drag and drop functionality to move the lowercase letter to a matching uppercase letter. When the child clicks on the lowercase letter it checks to see if the mouse position is within the movie clip. If it is the script allows the child to start dragging the letter.

```javascript
onClipEvent (load) {
    origX = this._x;
    origY = this._y;
}

onClipEvent (mouseDown) {
    if (this.hitTest(_root._xmouse, _root._ymouse)) {
```
When the child releases the letter the script checks to see if its position is within the uppercase letter movie clip. If it is the lowercase case letter positions its self in the center of the uppercase letter movieclip. A graphic of both letters then become visible and the reward sound starts to play. If the position of the lowercase letter is not within the Matching uppercase letter movieClip then the lowercase letter movie clip returns to its original position.

onClipEvent (mouseUp) {  
    if (this.hitTest(_root._xmouse, _root._ymouse)) {  
        this.stopDrag();  
        // see if the dropZone conatins the center of this mc  
        if (_parent.biga.hitTest(this._x, this._y, true)) {  
            // stop previous sounds  
            stopAllSounds();  
            // center it on the drop zone  
            this._x = _parent.biga._x;  
            this._y = _parent.biga._y;  
            _root.a._visible = true;  
            //play reward sound  
           mysound = new Sound();  
            mysound.attachSound("youvegotamatch.wav");  
            this.mysound.start();  
        } else {  
            // return it to its original location  
            this._x = origX;  
            this._y = origY;  
        }  
    }  
}
D 3. Telephone Game Code Snippet

In the telephone game, the parent is required to enter the telephone number of the child that will use the activity into a text box. The text box restricts the user to enter seven characters that must be numbers. When the user clicks done button or presses the enter key actionscript checks to see if the user has entered a value into the text box. If there is no value an error message is return to the user in a dynamic text box and the user is not allowed to proceed. Once the user’s input is validated to be correct the input is broken into to strings to add the dash and the user can proceed to the next frame. All of the activities that have data entry have data validation code that is similar to this snippet.

```javascript
on (release) {
  if(txt_phone == null){
    error = "Please Enter a Telephone Number!";
  } else {
    //This takes user input and breaks it into to two strings so
    //that an "-" can be inserted in the phone number
    p1 = new String( txt_phone );
    p2 = new String( txt_phone );
    txt_phone = p1.slice(0,3) + "-" + p2.slice(3,7);

    //go to next frame
    nextFrame();
  }
}
```
on (keyPress "<Enter>") {

    if(txt_phone == null){
        error = "Please Enter a Telephone Number!";
        //trace("its empty");
    } else {

        //This takes user input and breaks it into two string so that an ".-" can be inserted in the phone number

        p1 = new String( txt_phone );
        p2 = new String( txt_phone );
        txt_phone = p1.slice(0,3) + "." + p2.slice(3,7);

        //go to next frame

        nextFrame();
    }
}
References


9. U.S. Department of Education. Executive Summary. ND.