A USERS' GUIDE TO

Pizarro's Haunted Mansion:
A Money Game

A Hyperstudio Adventure created by:

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ACKNOWLEDGMENTS
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INTRODUCTION

This project was developed in *Computer Science 92*, an educational software seminar at Brown University. We worked in collaboration with Lona Robillard, a first grade teacher at Blessed Sacrament Elementary School in Providence, Rhode Island. The general purpose of the program is to reinforce basic money skills that are covered in the first grade curriculum. A secondary goal is the reinforcement of time-telling skills.

In this two-player game, students travel through a haunted mansion, stopping to collect coins, solve puzzles, and free ghosts. The puzzles cover a variety of topics including basic counting skills, comparison of larger and smaller values, and simple addition. The game is expected to take approximately twenty minutes to complete.

INSTRUCTIONS

I. Installation
See Appendix for detailed instructions.

II. Playing the Game

• Introduction

The game begins with the introduction, which presents the storyline of the game. The students learn that Pizarro the evil wizard has captured two friendly ghosts and is holding them in a cage that will open only if given twenty-five cents. Students are told that they must enter the haunted house and collect coins to free the ghosts. In order to progress through the game and proceed to different rooms in the haunted house, they must solve a series of puzzles. Upon leaving the introduction, students may choose between going to the "training grounds" (tutorial) to learn more about the skills they will need to solve the puzzles, or proceeding directly to playing the game.

• Tutorial

The purpose of the tutorial is to reinforce the basic money skills that are employed in the puzzles. The tutorial seeks to explain several different money concepts; they include different counting patterns, the use of different coins to constitute the same amount of money, comparisons of more and less, and the use of money for the purpose of buying things. The tutorial also integrates both sides of the coins, giving students the option to click on one side to view the opposite face of each coin. The format is interactive, with numerous options for clicking on buttons and coins to view animation. Many of the coins in the tutorial are accompanied by sound effects.

• Game Layout

The tutorial leads the students directly into the game mode, where they enter the first of a series of rooms. Before they begin the actual trek through the haunted house, the students are asked to type in their names. The names are used throughout the game portion of the program. All rooms have three doors and are associated with a particular creature (i.e. the mummy's room, the bat's room, etc.). Here they find a coin (a penny, nickel or dime, determined randomly) which they must click on in order to pick it up and proceed with the game. Students receive a message to pick up the coin if they click on the doors, walls, or creature in the room. Once the students pick up the coin, a button will appear that reads, "Solve the puzzle." Again, if the students attempt to click on the doors or walls rather than the button, the creature will explain that they need to solve the puzzle before going on to another room. If the students click on the clock in each room, it will tell them what time it is and how much longer they have to save the ghosts.

When they click on the "Solve the puzzle" button, a puzzle will appear with specific instructions, including a prompt which indicates the student who is responsible for answering it. For example, the instructions might read, "Jane, how much money appears on the table below?" When the students offer a wrong answer, then the program will explain why it is not correct and force them to try the same puzzle, but with different values before they can proceed to the rest of the game. When the students offer a correct answer, they are transported back to the original room and are congratulated for solving the puzzle. Now they may choose between the three doors to proceed to another room in the haunted house. After solving the third puzzle, the students reach a series of secret tunnels that take them to another section of the haunted house. After the sixth puzzle, they proceed to the closing scene, where they enter Pizarro's laboratory. Students will always receive and solve six out of the seven puzzles before arriving at the closing scene.

• Puzzle Types

There are seven puzzle types, six of which are accessed within a given game. The puzzle types are as follows:

1) *How much money is here?*   A series of coins appear on a brown table, under which lies an empty text box. Students must add up the amount of money on the table and type their answer into the allotted space. After they have arrived at an answer, they must click on the "guess" button to submit it. The puzzle will respond with an explanation if the students enter an incorrect answer. The students are given three guesses before the puzzle refreshes itself with a new value to guess. All of the following puzzles give similar feedback and will refresh if the students enter a wrong answer.

2) *Which one is greater?*   Students are presented with two piggy banks that hold different amounts of money. They are told to click on the bank with the greater value.

3) *Is there enough money?*   A toy appears with a price tag that displays a certain amount of money. A palette of coins also appears. Students must count the coins and decide if there is enough money to purchase the toy. They submit their answer by clicking on one of two buttons, "yes" or "no."

4) *Which one is the same?*   On the top of the screen is a yellow table with a certain amount of money on it. Below it are three other tables with money on them, one of which has the same value as the yellow table. Students must click on the button next to the table that holds the same value as the yellow table.

5) *Fill the piggy bank.* A piggy bank appears in the middle of the screen, while columns of coins lie on both sides of it. The students are instructed to put a certain amount of money into the piggy bank. They must do this by clicking on some of the coins. When they click on a given coin, it disappears from the column and reappears on top of the piggy bank. When the students click on a coin that is inside of the piggy bank, it leaves the bank and reappears in the column of coins. When the amount of money inside the piggy bank is equal to the amount requested, then the students must click on the "done" button to submit their answer.

6) *Buy the toy.*   This is very similar to the previous puzzle of filling the piggy bank except that here students are using the palette of coins to purchase a toy. A toy appears with a price tag that indicates a certain amount of money. Adjacent to the toys and coins is a picture of a bank.
The students must click on the coins to move them into the bank. As with the previous puzzle, clicking on the coins inside of the bank returns them to the coin palette. Unlike the previous puzzle, however, the bank indicates a running total of how much money it holds. Students may use this to compare their total with the price tag of the toy. This enables them to see the effects of moving coins in and out of the bank. When the amount of money in the bank is equal to the price tag of the toy, then the students click on the "done" button.

7) *Which one is different?*   Four circles appear with several coins in each of them. Three of the four circles hold the same amount of money. Students must click on the circle whose value is different from the other three.

• Ending

After the students have successfully completed six puzzles, they will enter the closing scene of Pizarro's laboratory. Here they must use the coins that they have collected to insert twenty-

five cents into a machine that will open the cage that holds the ghosts. The last clip shows an animation of the ghosts flying free.

EDUCATIONAL PHILOSOPHY

In the process of creating this game, we were faced with many difficult choices. This section provides justification for some of the decisions that we made.

• Game format

The game mode reflects a central goal of our program, the attempt to reinforce money concepts in a way that is fun and interesting. We did not intend for this program to introduce new concepts, but to reinforce what students have already learned about money in a fun way. We would like the students to want to play the game more than once. The game format also complements Mrs. Robillard's teaching style. Mrs. Robillard's first grade students chose the haunted house theme; we believed that involving them in the process would make the students feel more invested in our game. The narrative of Pizarro and the captured ghosts is intended to provide a clear goal for the program. We believe that having a goal gives meaning to the puzzles and prevents them from becoming decontextualized exercises.

• Two Player Mode

The two-player mode serves several purposes. The first is purely logistical; Mrs. Robillard has about twenty-three students in her class this year, but the lab at Blessed Sacrament has only twelve computers. Therefore, the project was designed specifically for use by two players at a time. Our decision to have the students type their names into the computer serves two purposes. The first is that it personalizes the game; we think that the kids will enjoy the illusion that the computer is "talking" to them. Second, the name option allows us to cue a particular student to answer each question. In the game, the students are collaborating rather than competing with each other to free the ghosts. Thus the name option is intended not to pit the students against each other, but rather to ensure that one player does not dominate the pair.

• Tutorial

Although the game was developed as a reinforcement of rather than as an introduction to money concepts, the tutorial serves as a teaching tool. In this brief lesson, students review the concepts that will be employed by the puzzles. It is as interactive as possible, enabling students to

actively click on things and to explore the coins. We felt that it was valuable to cue students into the types of concepts that are central to the game.

The tutorial is an optional component of the program that can be run after the initial introduction. We felt that it was important for students who had already played the game to be able to skip the tutorial. It is our hope, however, that students will explore the tutorial during their first experience with the program.

• Puzzles

The seven puzzles that we used all reinforce money concepts that constitute an integral part of the first grade curriculum. The puzzle types were constructed from reviewing popular math software for young children, consulting a first grade math textbook, and observing a math lesson in Mrs. Robillard's class. The emphasis on distinguishing between same/different and less/more is common for this age group. Also, the integration of piggy banks and buying toys helps situate the money concepts in a context that is real and meaningful.

None of the puzzles use more than one quarter because Mrs. Robillard informed us that students do not learn to count by the twenty-five pattern until the second grade. However, we have included this pattern in the tutorial for consistency and to possibly introduce it to students.

• Feedback

All of the puzzles provide students with both positive and negative feedback. When the students offer the correct answer, they are congratulated and then they receive the privilege of choosing a door to go to a new room. When the answer is incorrect, the computer explains that they are wrong. We believe that it is imperative for a program to allow students to fail; that is, to choose answers that are not correct. There would not be much educational value in allowing students only to click on a correct answer, because this may lead to blind clicking and does not ensure understanding. In addition, all feedback on incorrect answers includes an explanation of why the given choice was wrong. With the exception of the "How much is here?" puzzle, the puzzles reset with different numbers after the students offer one incorrect answer. In "How much is here?" the students are given three tries before the puzzle regenerates due to the open-ended nature of the question. When the puzzle refreshes itself with new values, the cycle continues. The students cannot progress to the next stage of the game without successfully completing each puzzle type.

The students are not penalized, however, for failing to solve the puzzle in the first round if they subsequently master the puzzle. The clock does not account for the number of attempts that it may take students to complete the puzzles. We do not see any point in penalizing students for this given that they are able to successfully solve the puzzle during a further attempt.

Furthermore, the program is set up so that mastery of six puzzles always leads to victory; that is, it results in students successfully rescuing the ghosts. We believe that positive reinforcement is necessary for children, especially at this young age. Mastering all six puzzle types is no small feat, and we see no benefit in the possibility of their losing the game if they are able to solve all six of the puzzles.

• **Choices/Randomness**

We believe that the ability to make choices—or the illusion of this ability—is a very important aspect of educational software because it gives students some control over their environments. Each room contains three doors, and students are given the privilege of choosing which one to go through after they have successfully completed a puzzle. In actuality, the progression to the next room is irrelevant of which door is chosen; it is determined randomly.

The game employs many elements of randomness. In the first game stack, only three of the four puzzles appear in a given sitting, and they are randomly called. This lends itself to a new experience during future use. The order of the puzzles is also random, as is the order of the characters' rooms that the players move through. All of the puzzles randomly generate the coins so that they may be used repeatedly. In addition to making the game more interesting and versatile, the randomness lends itself to the strict memory constraints that were imposed upon us by this project.

• **Time**

Time is a secondary theme of this game, and it occurs only in the background. The inclusion of time into the game is due to Mrs. Robillard's request that time-telling skills be reinforced through the program. Its secondary role allows it to be integrated into the program without detracting from the primary goal of money concepts. According to Mrs. Robillard, first grade students learn about time before money, thus the money program may be used to review time-telling skills. The clock advances by thirty minutes each time they enter a new room. This is used to show a progression of time. The thirty-minute interval represents the smallest increment of time that is taught in the first grade. Building into the theme the notion that the ghosts must be freed by 3:00 o'clock also adds a sense of urgency to the haunted house mission.

• **Authoring Tool**

Our primary reason for choosing Hyperstudio as our authoring tool was the memory constraints imposed by the computers at Blessed Sacrament Elementary School. The machines there are Apple Quadra 605, with only four Megabytes of RAM with which to run our program. We realize that Hyperstudio is somewhat limited, but the school's computers do not currently lend themselves to extensive animation or other special effects.