

TIME MYSTERY MISCHIEF

Superluminal Squirrels

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High Concept

Time Mystery Mischief is an Role Playing Game set in the future. The player is a member of a family in a small town which has a time machine for recreational use. The player discovers, however, that one of the villagers is trapping the rest of the town's people in the past using the time machine. Deciding to save the town, the player tries to locate every member of the village in space and time, and return them to their homes. The time machine is only useful, however, if you know where you're trying to go, and when you want to be there. As such, the player must use knowledge of the past (learned through the game) to collect historical 'artifacts' that, when inspected with various tools, reveal information about where villagers have been placed. Tools used will range from library research to radio carbon dating, and will help the player find discrepancies in history so that they can travel back to the proper time period and rescue each villager.

Key Game Features

1. Requires the students to understand what tools are available to explore the past by analyzing artifacts, historical maps, historical stories, radiocarbon dating, DNA analysis and more.
2. Requires the player to navigate a map setting both in and around the town and through various points in the past. In some cases, the same location is visited in two time frames, emphasizing variation of areas over long periods of time.
3. Utilizes fun mini-games for story progression and education about a particular historical investigation technique, such as fake 'DNA sequencing' for DNA analysis.
4. Uses the popular 'RPG' (role-playing game) format. The player represents a particular character who navigates a semi-realistic environment.
5. Designed to avoid linear game play to allow players to choose their own adventure.

Key Requirements

In order for success, this game will need:

1. 6th graders with a variety of game-playing backgrounds to be engaged for up to 30 minutes at a time.

If a player isn't involved with the game, the rest of the objectives of the game are guaranteed to not succeed. Boring games do not promote players paying attention, and thus we can't hope to succeed in conveying our learning objectives. This requirement is a 'gateway' to the success of the rest of the game.

2. Students have an understanding of what tools are available in historical or anthropological analysis.

The key learning objective of this game is to explore what tools are available to historians to explore the past. If students walk away having not learned anything, the game hasn't achieved it's primary learning objective.

3. To be fun to play in a 30-minute or less time period (e.g., short ramp-up and ramp-down times).

The teachers explained to us that between 10 and 30 minutes is about the game time that any group will be able to have. If the game takes 10 minutes to get involved with, the game is already a failure because the students may have to quit playing before they've really even begun to start.

4. To help students improve their spatial thinking (e.g. understand the usefulness of a map and a general idea of how to use/understand them).

The teachers emphasized the importance of maps and understanding the uses/spatial relationships behind them. If the student comes away having no idea how the game avatar made it from point A to point B, then the game is a failure as this is a key learning objective.

Competitive Analysis

Understanding other products that are available on the market today with similar goals is an essential step to help us understand what works, what doesn't work, and what has lost its value through over use.

In our search for educational games with similar objectives to *Time Mystery Mischief*, we came up with seven other games particularly worthy of note. Many of them had elements in common with one another, such as the use of puzzle mini-games and elements of mystery or fantasy.

Below is a description of each of these games.

Other Games Available

ClueFinders:

The ClueFinders series makes good use of puzzles and elements of mystery. The series follows a group of friends who go on a series of seemingly everyday adventures that turn out to be anything but ordinary. In one example, the kids try to fetch a frisbee that had fallen into a neighbor's yard, when the ground opens up and swallows them. The game attempts to enforce reading comprehension and grammar, spelling and vocabulary, fractional addition and subtraction, a bit of biological knowledge and logical reasoning. Overall, the game is effective in what it does, but its audience is limited to a very specific age group. Rather than focusing on a few core learning objectives, ClueFinders tries to emphasize a variety of different objectives. This is effective in keeping the educational aspect of the game more subtle, but limits the depth to which the game can go.

Jumpstart

Similarly, Jumpstart (6th Grade) follows two siblings who are trying to save the earth from a haywire computer. Jumpstart also makes good use of puzzles and nine specific mini-game-like tasks. The puzzles have a lot of variety which is good, but from a small sampling of people we spoke to who had played the game as children, the puzzles have a higher appeal for females than for males. Additionally, the progression is limited, as you must complete each puzzle before continuing to the next. This makes it easy for the user to become frustrated due to an inability to complete a single puzzle.

Carmen Sandiego

Carmen Sandiego [sic] is a geographical education game utilizing puzzles/mysteries in which a group of kids hunts down the villain Carmen Sandiego and her henchmen. Like Jumpstart, Carmen Sandiego has problems of getting stuck at a point where one is unable to continue. From our own experiences, it can also be frustrating because there is a limited amount of time for the player to complete tasks. One of the most compelling elements of the game is the element of mystery and the large variety of tasks to complete.

Zoombinis

The Zoombinis games use logical puzzles to entertain the player. The Zoombinis themselves, blue egg-shaped creatures with a variety of changeable features, are fun characters that you must guide through various logic games (based on what features they have) to save them. This gives the game a strong feeling of personalization, which is very effective.

The games puzzles are fairly universally fun, and those that you do not enjoy can be avoided. This helps the game avoid players getting stuck, and makes it much more replayable. Memorable voice acting helps keep the game entertaining and makes the characters fun to interact with. We hope to create similar characters. Challenges for our game will need to be of greater difficulty than those of Zoombinis, however, as the game is geared towards a slightly younger audience.

Gizmos and Gadgets

Gizmos and Gadgets is an educational game designed to teach simple physics and mechanics. It has an platforming element and a variety of puzzle mini-games. The player collects various items and combines them to create machines with which to thwart the nemesis. In our opinion, all of these portions of the game were highly effective. When we played the game as kids, we disliked that there were non-interactive (cinematic) portions of the game that you would reach which you could not skip, as they were frequent enough to be boring.

Math Blasters

Math Blasters is, as the title suggests, a mathematical educational game. The game follows an space hero and his friends who have to complete a series of small challenges to complete a larger mission such as rescuing their dog. From our perspective, for a person who enjoys math (and some logic/patterning sections) it is well-designed. Such users will have easily understand the intuitive interface, probably enjoy the space theme and enjoy the math element. While the game was designed to help instill a love for math, we feel that users who do not like math would probably enjoy the game far less. The game is specialized to a point that limits its audience.

Mavis Beacon

Mavis Beacon is a typing game. As such, it is not directly relevant to the genre of game we chose to create. However, analysis of it did reveal a flaw we seek to avoid: we felt the difficulty curve was too steep; some of the mini-games were unpleasant if your typing speed was not especially fast, and too few games emphasized increasing typing speed.

Mario's Time Machine

After coming up with our plot (which involves a time-traveling villain), we discovered this game's existence; as such, we thought a comparison appropriate. Of course, part of the advantage of this game is the familiar Mario characters, which we cannot use. It additionally makes use of partially non-linear progression (you can proceed to seven different times initially, although the last location is fixed and you must complete all of them to complete the game). The game support of multiple endings (based on whether you collect items in the proper order and fast enough) is an interesting idea which we could use to enhance replayability. Although labeled as an educational game, it only teaches about a small number of events in history, so it does not have an exceptional scope.

Advantages of Our Game

Our game, upon completion, should have a number of advantages over these other games. The first and foremost is that it will fulfill the customer's desire to educate about their relevant learning objectives; the other games were created to appeal to a broad set of educational facilities, whereas ours will be specifically designed for a single institution. We incorporate fantasy and mystery similar to some of the aforementioned games. We also hope to support substantial personalizing of the game; currently, we plan to have multiple versions of the main character from which to choose. We seek to incorporate the use of a wide variety of puzzle mini-games, with enough variation that some games will appeal to any potential user. We feel this is the best way to explore the various ways which historians use information to learn about the past, and it also has the advantage of offering a variety of distinct logical challenges which the user can enjoy. We will also hope to create a variable level of difficulty; the user should not become frustrated with our game because of inability to progress. To do this, we plan to create an adjustable difficulty setting, allow for non-linear story progression so that one specific challenge will not hinder the user, and have an easy-to-understand interface so it is not difficult to learn how to play.

Overview of Game

Premise and Story Synopsis

You, the protagonist, are on a school trip with the librarian, Prof. Woodsworth... through time! The village in which you live, Taranheim, is the only village in the world that has a time machine available for recreational and educational purposes. Upon your return to the village, you and the librarian find that everyone in the village have gone missing. You set out to explore this mystery while Prof. Woodsworth goes to check out the time machine and tells you to meet him back at the library. After wandering around, you happen upon General Eric Vladimir Lynne, another member of the village whom you have known all your life. He is engaged in a soliloquy about his nefarious deeds - he is the one who has been abducting villagers. He's kidnapping them in order to secure use of the time machine only for himself, in order to conquer the world!

Upon hearing this, you head back to the library to talk to Prof. Woodsworth, and tell him what you saw. He reacts by laughing, "You are still a young lad/lass, young, Gen. Eric V. Lynne would never do something like that! I know he is a good person... you must be mistaken. He has probably been abducted like the rest of the villagers."

The librarian then explains to you that the time machine has a number of limitations. Nobody knows how it got there and most are not especially good at using it. You can't travel into the future, only to the past (such that, although you can interact with characters from other times, you cannot take historical figures to the present). You can't travel back onto your own timeline - you have to go to times before you were born. Lastly, you need a "return device" in order to come back to your present time. Then, after looking at some books on the history of your town, the two of you realize that the villagers have been trapped at various points in history.

From this point, you start searching for artifacts that will assist you in finding the villagers stuck in the past. The librarian often gives 'hints' as to where to look for artifacts. Once you've found an artifact, the librarian helps suggest tools that you might use to better understand what the artifact is telling you. From there, the player will find the analysis point (a laboratory, a library, the local historical society, etc.) and analyze the artifact (via mini-game). When analyzed, the artifacts should show a historical anomaly that will offer some insight into where and when to find a villager, allowing the player to go and retrieve the villager using the time machine. Each mini-game represents a different analysis method.

To ensure the player is learning as they go, the time machine asks the user a series of simple, multiple choice questions. These questions are designed to reinforce the learning objective of what tool they just used to learn about the artifact, and what they were able to learn. After rescuing enough villagers, the player (and town) confront Gen. Eric V. Lynne, and banish him from their town.

Mini-game Design

Mini-games are designed to vary considerably based on the method they're trying to demonstrate. A mini-game for DNA Analysis might be fake 'DNA sequencing' as done by a *Bejeweled*-like game. The purpose of the mini-game would be to link strands of colored pieces, each piece corresponding to A, T, C or G, the 4 types of nucleotide bases used in DNA. Alternatively, a scrambled-picture puzzle might represent restoring an artifact or document that has dates on it that you need, but has been partially destroyed from time. A simple math puzzle game could help the player deduce when a villager was relocated to. Using the date that they were hijacked, their age, and historical references to them in old newspapers, they might be able to deduce things like "they were 32 when they left, but in this paper from the year 3125, they were 47, thus they were placed in that time period sometime around the year 3110".

Game Design Rational

After considerable brainstorming about which learning objective sparked our imaginations the most, we chose to investigate how to explain the variety of sources that historians use to explore the past. We decided that one of the best ways to understand what resources were available was through making the students 'do' each of the techniques. Since our objective focused on expressing what techniques were available, not the technical methods behind each method, we could focus on mini-games being fun rather than educational.

After completing the Competitive Analysis (summarized above), a few take-home messages were discovered. The mini-game format is in fact, a tried and true method for keeping educational games fun. Many of the other games suffered from their players getting stuck and not being able to continue.

The best games allowed their players to do a variety of tasks at any given point, allowing them to avoid or circumvent the area in which they were struggling. As such, the ability to jump around is now a key element of our game.

A concern for us going into the competitive analysis was whether or not our game's story was age-appropriate. Another conclusion drawn from that analysis was that our game was very in line with other products available to the 6th grade educational market such as Carmen Sandiego and the upper-end of the Jumpstart series.

After talking with the clients, it became clear that the clients also wanted to emphasize the use of maps, even if their use was casual or subtle. This solidified our idea of using a role-playing game where the user would navigate a map to reach parts of the game.

To help better ensure absorption of the material, the clients suggested a few simple questions that would be asked about each artifact that they students would learn from the mini-game analysis. This has been incorporated into the time machine's questions about where and when to go, and how the analysis told them what they needed to know.

The clients also clarified for us that one of the few game formats that many of their students would be familiar with would be small Flash-based mini-games. This was further evidence in support of our heavy mini-game use, as we know the format is appealing to the age group.

Technical Project Overview

The game will be written in C#, and will be based off of the RPG starter kit using the XNA Game Development Toolkit released by Microsoft. This decision was made after a fairly comprehensive analysis of game toolkits available. Our goal was to be able to use pre-written code as much as was possible. This allows the game to be developed relatively quickly and inexpensively (in terms of time and knowledge of those involved), which in turn helps us focus on the important parts of the game: making sure it's educational and fun.

Many other toolkits we investigated, many of which used Java or C++ as their base language, and most were not nearly as powerful as the XNA framework. The XNA framework is designed specifically to be used in writing high-quality video games.

Even if you have a powerful framework, a game relies on a lot of base-code, especially if you want your quests and challenges to be fairly mutable and flexible. The cinching part of the deal for XNA was that it provided the RPG starter kit. This starter kit starts off as a fully functional role playing game, albeit a fairly lame, short and simple one. Most starter kits we found were designed around a simple mini-game model and were not to be scaled to a more sizable game. The RPG starter kit with XNA allows us to jump directly into the storyline.

As for development, the game lends itself to an iterative development style. We can code a portion of a quest (say, rescuing a single villager), and test and improve that section. This also allows multiple programmers or teams to tackle multiple portions of the game. By having several teams creating quests to save individual villagers, a great deal of parallel development can occur. Additional teams can be set to work on graphical improvements (separate from the quest development) to improve the presentation of the game.

Most of the strict 'architecture' of the program has been pre-determined by using the starter kit that we are using. The game is broken into different types of content objects such as maps, quests and players, who interact with other objects such as items, chests, and (newly) artifacts. We've been working to expand the architecture to support our time machine, artifacts and mini-games.

Risks

Design and Development Risks

Designing and building a role-playing game is a large task, and one of the largest risks in development is satisfying both ourselves and the client that the product is finished and polished. To some extent, this risk is mitigated by the inherent modularity in our game design. As development continues through much of the remainder of the semester, the number of villagers can be scaled back to make the game smaller, but more polished. We currently believe that one to two villagers per group (in a class of roughly five groups) will be appropriate, but seeing that we have not been given a timeline by the course instructors, it's hard to say whether or not this will be an appropriate amount of work for the time provided. Hopefully this will become more clear as time progresses.

Another significant design risk is that when the game is completed, our educational objectives will be incomplete, and thus the game will be a failure. This would happen if, for instance, the students played through the game and in the end, learned nothing. This risk is hopefully mitigated by the addition of questions asked by the time machine for each villager. This will be further mitigated by some limited user testing which will allow us to tweak the questions and quests to better accomplish the objectives.

There are also smaller risks such as the game play running for too long (as the client said we should expect a running time of 30 minutes at the most). That particular problem can be addressed by our game supporting saving progress, and by reducing the number of villagers or making the challenges simpler. These smaller, more technical challenges are fairly easily handled by either reducing complexity or by modifying game length or difficulty.

Team risks

Another significant source of risk is the development team: a bunch of overworked college students. College students are, by and large, flaky. This problem can be somewhat mitigated by breaking the work up into small teams, allowing for some fail-safes. If one member of the class particularly doesn't contribute, the team can respond accordingly to pick up the slack or chastise the team member. Additionally, this problem is further mitigated by the installation of strict deadlines and milestones, similar to those used in project 1. We can't set dates for these yet, as a timeline hasn't been released by the course instructors, but deadlines might be of the nature of "first draft of artifact details and learning objectives for analysis method", "initial version of working mini-game, conveying learning objective", etc.. If this project is continued, these deadlines should be nailed down by the first of October.

Concept art



Protagonist and the Librarian



Gen. Eric V. Lynne

The characters on the left are the actual in-game avatars for the main character and the librarian. The rendering of the villain (right) is purely concept-art, and will be modified for in-game viewing.