Satoshi's Gift

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INTRODUCTION

Artist's Statement
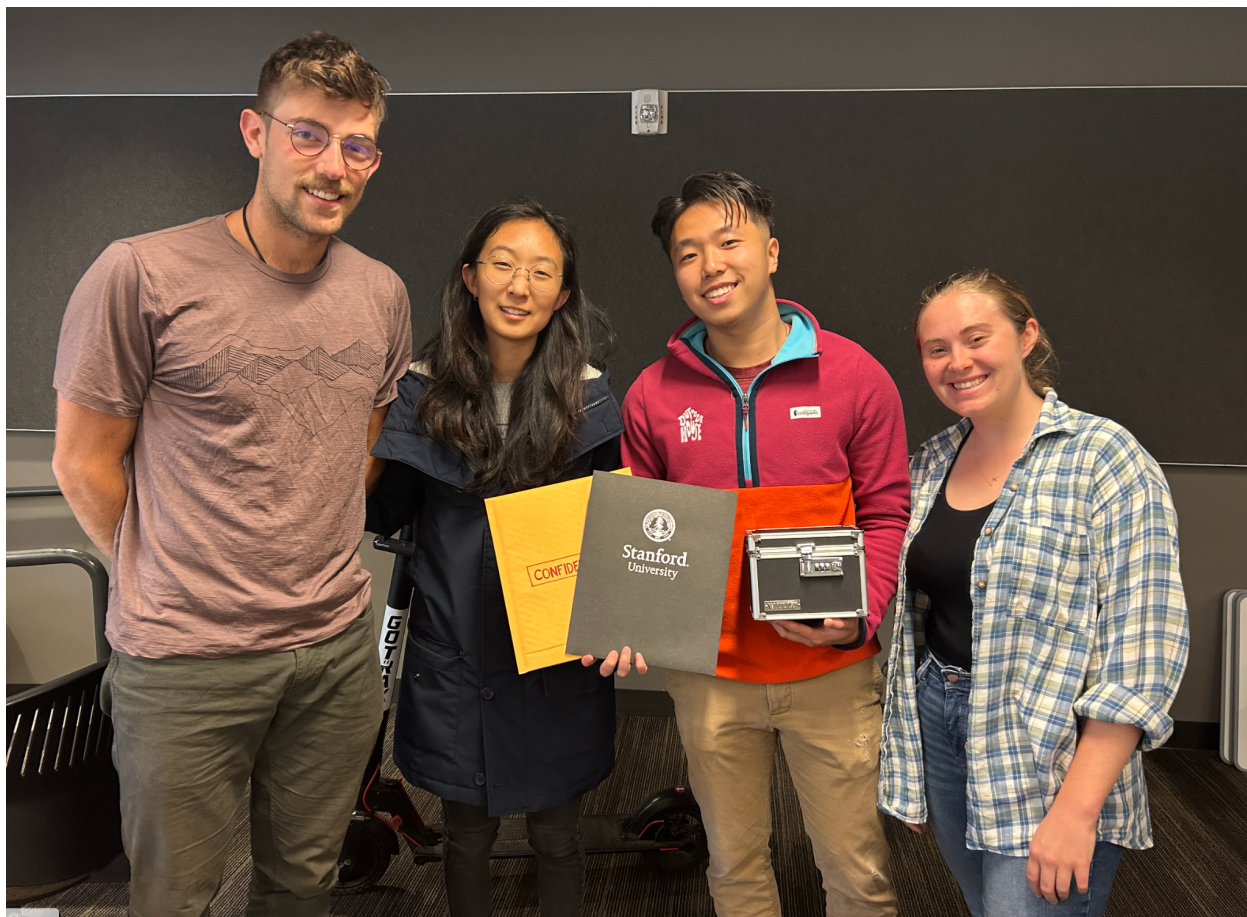
"Bitcoin is a decentralized currency that is built on the blockchain. Its innovations have pushed the boundaries of digital assets and financial technologies as we know it today. However, the real identity of its creator remains a mystery. All we know is that the person or organization that created this technology goes by the alias "Satoshi Nakamoto" and that around 980,000 Bitcoins, or 42 Billion dollars, are associated with wallet addresses with Satoshi.

Recently, a shocking revelation reveals that the secret identity of Satoshi might be a Stanford University professor who recently passed away. Rumors say that they have left some secret messages for students at the school.

You, the players, have the chance to solve the puzzles that Satoshi left behind. If you were to succeed, Satoshi's lost treasure might be unearthed once and for all. Are you ready to set out on this adventure?"

Goal

This is an analog game. The reason that we chose this theme is because a large portion of the back story stays true to reality. We thought it is really important to develop a story that could make the player feel like this could actually be happening and feel the same excitement as if it were a real-life event. One of the things that we really enjoyed crafting is constructing the personality of Satoshi through a combination of digital and physical items, including an annotated draft version of the famous "Bitcoin White Paper," Satoshi's dialogue about his younger self, Satoshi's personal MP3 player, and a physical crypto cold wallet, Ledger. These objects are weaved into different sections of the puzzles and serve their purposes in the whole story. Our goal is to not only let the players have a good time playing the game but also educate our audience about what is the intention of the blockchain in the first place and its merits, despite the recent events that caused damage to cryptocurrency and blockchain.
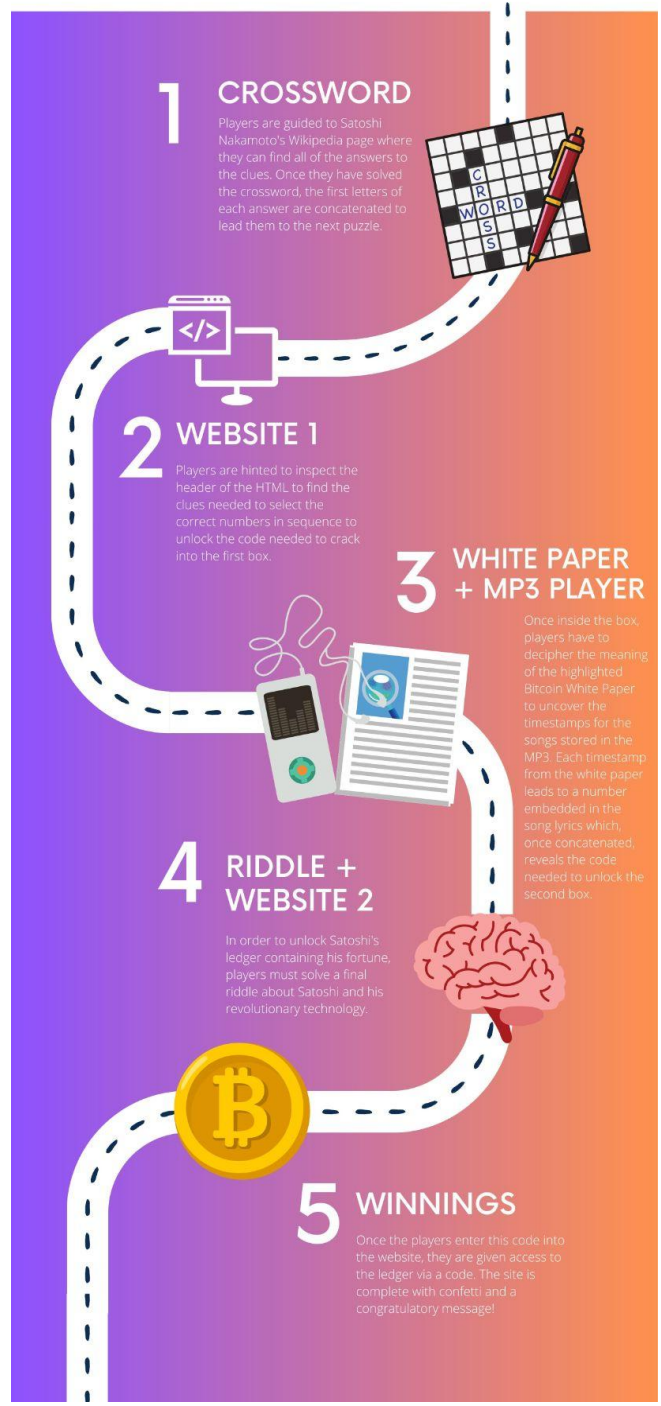
Target Audience

The target audience of this game is teenagers and adults who have some knowledge of computer science and are curious about the history and technologies behind the blockchain. There are a lot of blockchain lores and history in this game and some of the mechanisms require the player to have some basic level of web knowledge to solve. The game can be played for 3-5 people. There is one gamemaster whose role is to guide the rest of the players through some procedures of the game and give hints to help with the flow of the gameplay.

SYSTEM MAP

SATOSHI'S GIFT

1 CROSSWORD

Players are guided to Satoshi Nakamoto's Wikipedia page where they can find all of the answers to the clues. Once they have solved the crossword, the first letters of each answer are concatenated to lead them to the next puzzle.

2 WEBSITE 1

Players are hinted to inspect the header of the HTML to find the clues needed to select the correct numbers in sequence to unlock the code needed to crack into the first box.

3 WHITE PAPER + MP3 PLAYER

Once inside the box, players have to decipher the meaning of the highlighted Bitcoin White Paper to uncover the timestamps for the songs stored in the MP3. Each timestamp from the white paper leads to a number embedded in the song lyrics which, once concatenated, reveals the code needed to unlock the second box.

4 RIDDLE + WEBSITE 2

In order to unlock Satoshi's ledger containing his fortune, players must solve a final riddle about Satoshi and his revolutionary technology.

5 WINNINGS

Once the players enter this code into the website, they are given access to the ledger via a code. The site is complete with confetti and a congratulatory message!

GAME MECHANICS

Players
- **Target Audience:** Students who have some familiarity with cryptocurrency and computer science
- **Target Number:**
  - 1 gamemaster
  - 2-4 active players

Objectives
- **Crossword Puzzle**
  - Solution - use the Satoshi Nakamoto Wikipedia page to find answers to clues
  - Parallelize the work - one person writing on the crossword puzzle, others working on the clues, searching the Wikipedia page
- **First Website**
  - Inspect the HTML header - hint embedded in the paragraph on the website
    - Uncover the hidden meaning of the paragraph and what is hidden in the HTML
  - Use the clues—direct coordinates as well as info embedded in the letter and the crossword—to correctly click the numbers in the correct sequence to get the code needed to get into the first box
    - Realize the coordinate system is 0-indexed and starts at the top left corner of the grid of numbers
    - Realize one of the hints is in the letter and the other in a crossword clue
- **White Paper and MP3 Player**
  - Notice that the word "timestamp" is highlighted
  - Notice different colors that are used to highlight
  - Identify the red herrings and find the correct numbers that will lead to a timestamp
  - Connect the numbers from the white paper lead to specific timestamps in the songs
  - Exploration - find the numbers embedded in the song lyrics and string them together to get the code to unlock the second box
- **Riddle**
  - Outwit - realize the two components are the year Bitcoin was created (20090 and the creator's name (Satoshi)

      ○ Input the answer into the second website
- **Second Website**
  - Give players adequate dopamine and satisfaction at solving the riddle and finishing
    - Complete with confetti and a congratulatory message
    - Also informs the user of the passcode key to the Ledger
  - Congratulate players for their win
- **Ledger**
  - Chase - finding treasure
  - Use the link written on the back to access the final website
  - Use the code from the website to unlock the ledger

Outcomes
- **Zero-Sum Game**
  - Players either make it to the end of the game and win or run out of time and lose
  - However, each puzzle leads to the next, so even if players don't finish the entire game, they can still have fun going through the puzzles and solving them as individual aspects of the game.

Rules
- **Timer**
  - Give players 1 hour to complete the game to introduce a sense of urgency
  - Connected to the hints system
- **Hints**
  - Given by Gamemaster
  - Players are only given hints when they ask for them
  - Each hint inflicts a 2-minute penalty
- **Use of Internet**
  - May use the Internet to go to the Satoshi Nakamoto Wikipedia page to solve the crossword puzzle
  - May use the Internet to find the year that Bitcoin was created
  - May use the Internet to access the two website puzzles
- **Gamemaster**
  - Given a complete script including hints and the correct answer for each puzzle
  - Helps with game flow
  - Interjects to give hints when asked or when explicit lines are to be said as shown in the script

○ Keep track of the time taken to complete the game
■ Keep track of all hints given and add # of hints x 2 minutes to the overall time

Procedures
● 1 player acts as the Gamemaster while the rest will be active players
● Gamemaster begins the game by reading the script
● The Gamemaster hands players the envelope containing the letter from Satoshi and the first puzzle and then starts the 1-hour timer

Resources
● **Gamemaster**
  ○ The initial letter from Satoshi
  ○ Able to give puzzle-specific hints when asked
  ○ Understanding of game overview so can provide general guidance if needed
  ○ Satoshi Nakamoto's Wikipedia page
  ○ Small snippets of the script to fit with theming and lore
● **Embedded Hints and Feedback**
  ○ "Wiki-whiz" and Wikipedia logo in the crossword puzzle header
  ○ Spaces and green dots appear when players click on the correct numbers on the initial website

Boundaries
● **Physical Items**
  ○ Letter from Satoshi - part of the lore, embedded hints connected to the first website
  ○ Crossword puzzle - teach players about Satoshi and crypto, the easy first puzzle
  ○ Highlighted physical white paper
  ○ MP3 player - part of the lore, Satoshi is thought to have grown up in the 80s, tactile puzzle figuring out the "old" technology
    ■ Song 1: Dancing Queen
    ■ Song 2: I Want It That Way
    ■ Song 3: Separate Ways
  ○ Boxes - locks that need to be opened, need to be able to fit everything in the boxes
  ○ Riddle - part of the lore
  ○ Ledger - part of the lore

- **Digital Items**
    - Satoshi Nakamoto Wikipedia page - used to solve crossword puzzle
    - Songs - creates fun, leads to code needed to get into the second box
    - First website - used to get code to get into the first box
    - Second website - used to wrap up the game and reward players for their win
- **Time**
    - Bounded by the 1-hour time limit
    - 2-minute deductions per hint requested

GAME AESTHETICS

Sensation
- With the different physical items, we wanted to create a vibe that was consistent and tangible to the players.
- Much of the attention we drew to Satoshi's work had us looking backward at his life. We wanted to include items that were reminiscent of the 80s.
  - We chose to do this by incorporating songs from the 80s into the MP3 player puzzle, hoping that these songs would be playing and keep the players in the world we were creating for them.
- The hybrid/multimedia nature of the game was also important in creating a world that felt real - with elements, the players could touch - yet still technical, in line with Satoshi's background.
- We also felt that this hybrid gameplay mimicked the nature of Bitcoin itself - a digital currency with real-world value and implications.

Fantasy
- The game's narrative builds on the real-world mystery surrounding Satoshi Nakamoto. The narrative we've created builds on this to create a more rich view of the story and lets the players feel like they're in on a secret.
- The inclusion of the gamemaster was a decision to bring a fantasy voice into the game to help curate the vibe further and give guidance right from the beginning.
  - The gamemaster also helps keep the flow of the game moving and provides a continued layer of interaction. This is to help keep the players from getting too distracted and removed from the game environment.

Challenge
- We tried to instill a sense of competition in the game through the initial introduction by the gamemaster.
- The timing elements - both the limit and additions that came with hints - also encouraged players to work as fast as possible and limit their usage of hints. It also played out as our playtesters were competitive with each other on letting each other ask for hints.
- The puzzles present various challenges of different types and difficulties. Some knowledge of computer science is ideal, but the hint system makes sure it is not impossible for someone without this knowledge to complete.

GAME DYNAMICS

- **Collaboration and Competition**
  - The game is designed to be played with 2-4 active players plus a gamemaster, ideally fostering a collaborative environment with different social dynamics at play.
  - Players need to work together. However, there is a sense of competition due to the time limit and the idea in the narrative that they are competing with other teams simultaneously.
  - This creates a balance between collaboration and competition, encouraging communication and strategy between players. This results in very different tactics and scenarios depending on the makeup of the group playing the game, as observed in playtests.
- **Resource Management**
  - The inclusion of hints and time penalties is a form of resource management for the players to deal with. They need to decide when to use hints, as each one incurs a time penalty. They also need to factor into this decision-making the unknown difficulty of future puzzles which they may need to use further hints.
- **Exploration and Discovery**
  - The structure of puzzles and clues encourages players to use both the physical and digital components to uncover more about the narrative so it might help them complete current and future puzzles. They also are required to learn more about Bitcoin and the crypto ecosystem in general to satisfy puzzle requirements.
  - This dynamic of exploration is important to the overall gameplay as it both aims to build and satisfy the players' curiosity and sense of achievement as they move through the game.
- **Gamemaster**
  - The gamemaster dynamically influences the game as it progresses, keeping it running smoothly and making sure the players don't stray too far from the mission so that they might become too confused or bored.
  - The gamemaster's choice to interject, or not, shapes the player's experience and adds a unique, dynamic element to the game that changes with each play.

PLAYTEST ITERATION

Playtest 0

Who Playtested
We had each team member come up with 3 puzzles to bring to class and playtest. We took 3 puzzles and 1 idea of a puzzle from this playtesting, choosing the best one that each team member brought, and moved forward with these puzzles.

What was Tested
We fully playtested all of the puzzles that our teammates brought in which totaled around 8 puzzles. This included the crossword, the whitepaper, and the riddle.

Observations
We realized that they were interesting enough and complex enough to take up a good amount of time and brainpower. It was in this iteration we realized that our game would be one that would require multiple people to think together and brainstorm ideas together in order to solve each puzzle.

Changes Going Forward
We knew that we wanted to incorporate each of them - the crossword puzzle, the website with notes hidden in the HTML, the whitepaper puzzle, and the riddle - but needed to figure out how we were going to fit them together into a cohesive game. One of these pieces was in regard to the whitepaper puzzle. We knew that the answer could be a timestamp or a code, but we didn't know what exactly it would be at this time. Similarly, the crossword was in a state where we could use it to link to a code or a clue, but we, later on, decided to have it link to the website hosting the next puzzle. This is what we spent most of our next 2 iterations working out. We also knew that we wanted to incorporate some physical elements into our game, so we brainstormed using boxes and locks to help create the game flow.

Playtest 1

Who Playtested
2 CS247G classmates

What was Tested
In this playtest, we were given ~20 minutes in class to test a part of our game, so we decided to playtest the whitepaper puzzle and songs to see if the connection between the two elements worked together.

Observations
Without any explanation, we gave the players the two pieces, the whitepaper, and the songs, and we had them test the puzzle. Fairly early on, the playtesters needed a hint about what to do, and we gave them hints to get them on the right track. They had some difficulty trying to figure out the highlights in the whitepaper with all of the red herrings, but they enjoyed listening to the songs and scrubbing to the correct spot to find the code.

Changes Going Forward
We decided to make the highlighting in the whitepaper a little more intuitive and remove the ROYGBIV connection afterward. Furthermore, we also had an idea between the 1st and 2nd play test to bring in more physical elements to make the process fun. We order an MP3 player so that the player doesn't have to play the songs on their own phones (songs may not be available depending on the streaming services, etc.). The MP3 is old and can evoke the players to think that there are secrets hidden in Satoshi's personal items. And the players have to figure out how to use the MP3.

Link to Playtest Video Clip
https://drive.google.com/file/d/1jDhbqwJgSfEV6rEZY4Bk8JcwRKvZ7652/view?usp=drive_link
In this video, the players were first presented with the white paper and spotify playlist. They were looking through the white paper to figure out what the highlights meant.

Playtest 2
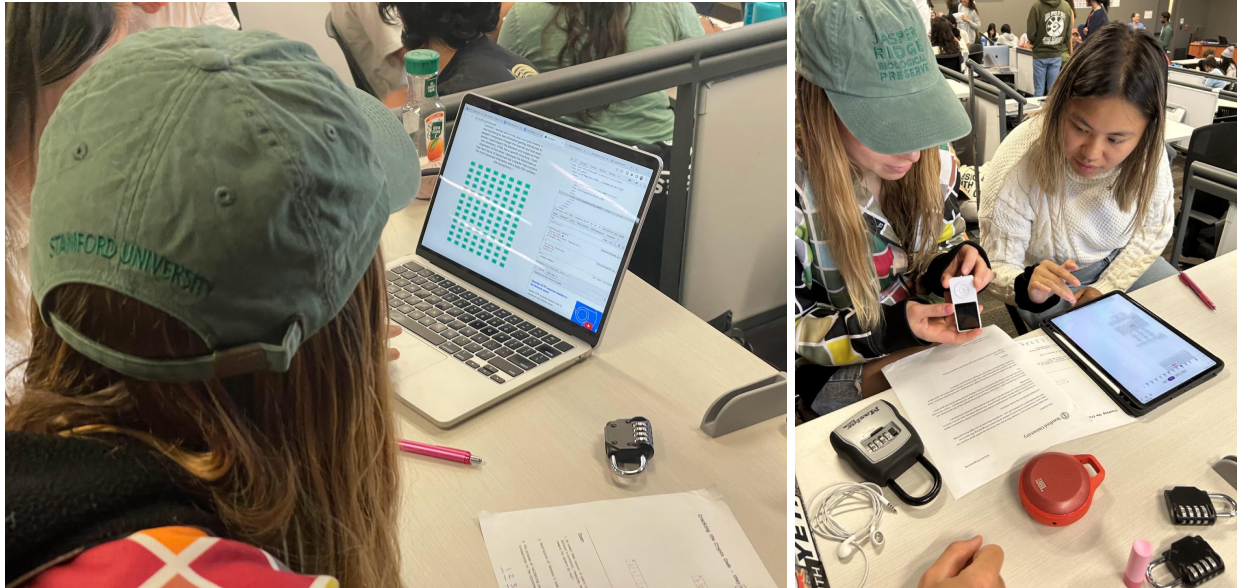
Who Playtested
2 CS247G classmates

What was Tested
In this playtest, we put different puzzles including the crossword, the website, and the riddle together for the first time. Our goal was to measure the flow of the game and have some sense of how the narrative facilitates the gameplay experience. We also wanted to measure the overall difficulties of the puzzles.

Observations
We realized that there might be too many crosswords at the beginning of the game since it took a long time making it slow to start the game. The website at this point had a timer, tries, and the phrase "inspect the shadows". We found out that the timer did not really help with the puzzle experience, it made it more confusing for the players because it wouldn't make sense if we only keep time for some puzzles but not the others. We also found out that the website was confusing to use. To pass that level, the players

needed to enter a series of numbers in the correct sequence, and each time the sequence is broken, they have to start entering from the beginning. But there were no visual indications of that, making it difficult for the player to see whether the passcode is reset each time after an error. For the riddle, we realized it was too hard to solve without any hint. At the end where the players enter the passcode and unlock the ledger, we observed that the players weren't as excited as we thought that they would. We suspect this is because the ledger does not show the number of assets when it is logged in. At the end of the playtest, Shana also gave up the advice that we should think about how to implement the hint system. Overall, it was nice to learn that the players really enjoyed the story and how different pieces connected to each other. The difficulties overall were challenging enough but also rewarding to the player.

Changes Going Forward

From the above observations, we decided to implement the following improvements to the puzzles. We revised the crosswords to become shorter. On the website, we decided to add a UI that shows the status of the passcodes, meaning that the players can see how many digits they have entered, whether they are correct or not, and whether they should enter it again from the beginning. We also removed the timer because it didn't make sense to have it at this stage of the puzzle. A paragraph from Satoshi was added to provide hints about inspecting and which elements should be inspected. The riddle was made more straightforward. And the role of the gamemaster was added to keep track of the overall time and to provide hints when necessary to facilitate the gaming process.

Link to Playtest Video Clip

https://drive.google.com/file/d/1f9WCFVbXDMg6JYhGngCx_vbYEHHG18hh/view?usp=sharing

Playtest 3
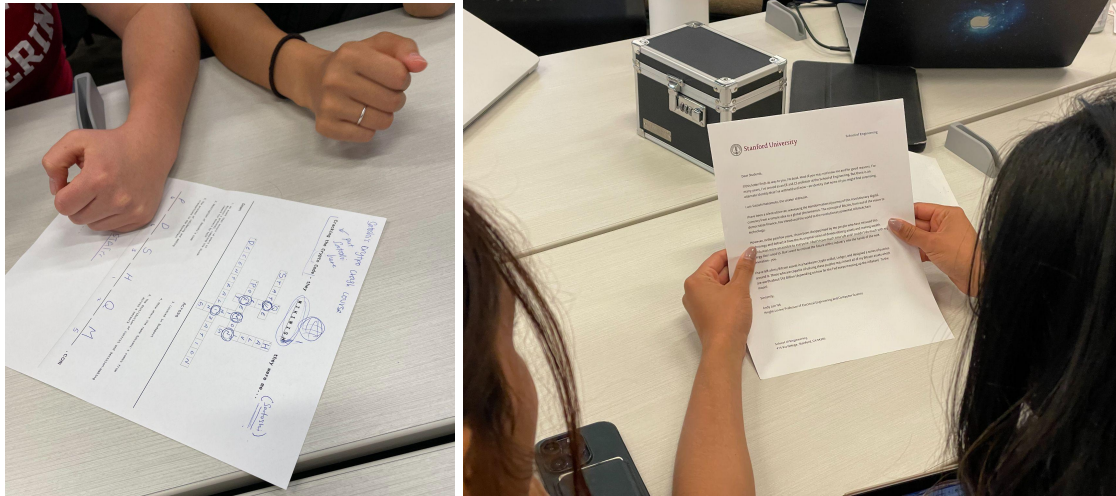
Who Playtested
3 classmates from CS247G

What was Tested
In this playtest, we started at the beginning of the game and ran the game up until the white paper and MP3 player, which is what time permitted.

Observations
Players didn't understand the "wiki wish" clue in the header of the crossword and ended up being stuck on the crossword before needing a hint to visit the Satoshi Wikipedia page. One person acted as the scribe and would fill in the answers while everyone else spent time trying to find answers to a single clue; they didn't parallelize and work on different clues but instead, all worked on the same clue together. Players intuitively filled in the blanks at the bottom of the crossword with the first letters of the words in the crossword puzzle, but only after we numbered them; without the numbers under each blank, it was unclear to the players what should go into the blanks (that would be lead them to the bit.ly for the next clue). In regards to the website, the players very quickly understood that they needed to "Inspect" the HTML. They tried to inspect the buttons, but then understood they needed to inspect the header. Additionally, the feedback via the spaces and green dots corresponding to the correct buttons clicked in the sequence was helpful and allowed them to quickly understand the goal of the puzzle. Players really enjoyed the physical elements of the game like opening up the box and also seemed to enjoy seeing the MP3 player.

Changes Going Forward

To make it more clear that Satoshi's Wikipedia page should be visited in order to answer the crossword puzzle, we will change the clue to be "Are you a Wiki-Whiz?" as well as add the Wikipedia logo to the header. Additionally, we will number each of the blanks that will correspond to the first letter of each word since the first letter seemed to be more intuitive than the whole word. This string of concatenated letters will lead players to the next puzzle which is the initial website.

Link to Playtest Video Clips

- Players needed for the blanks on the bottom of the crossword leading to the website to be numbered
    - https://drive.google.com/file/d/1Xtxp1FfAHtGeKxvwKhMm6lskNWA0Qzm0/view?usp=drive_link
- Opening the first box and finding the MP3 player, white paper, and inner box
    - https://drive.google.com/file/d/189CjjjDVfDByUrECIROj-ZWGsEaETt_-/view
- Working on the website puzzle requiring players to inspect the HTML
    - https://drive.google.com/file/d/1Cm5gB2x2omu5fVE5II6P9rFnV3jAP5R2/view

Playtest 4

Who Playtested
1 Aero Astro Masters student (gamemaster)
2 CS Seniors
2 non-CS underclassmen

What was playtested
This playtest was the first playtest where we were able to playtest our entire game altogether with physical components included. It was also the first playtest that was done with our target population of at least one CS-interested person and outside of class, where our playtesters are also game developers and have been as immersed in the game design process as we have.

Observations
We realized quite a number of things in this iteration, including that our puzzles may be too easy, depending on who plays them. As two of our playtesters were CS seniors who had both created personal projects in the crypto space, we realized that our puzzles may have been too easy and in their expertise. They finished the entire game in 20 minutes, whereas in previous playtests, some puzzles had taken a full 15 minutes. In reaction to our previous playtest, we had iteratively made our puzzles easier and easier, but we realized that we may need to increase the difficulty a little bit in order to make the gameplay last between 40 min - 1 hour which was our target length.

One interesting takeaway was that although we had originally told the group that they were allowed to use a computer, their reaction to the crossword which had a Wikipedia logo on it, wasn't to look at Wikipedia. They tried to use their own knowledge to fill in most of the puzzle, which they got most of, before realizing they might need extra help. Once they realized, they exclaimed "we're do dumb" and went directly to the Wikipedia pages and quickly solved the rest of the crossword.

Another interesting takeaway was how quickly the players got through the website puzzle. There was a split in the group of 2 CS seniors and 2 non-CS underclassmen, and once they saw the website, the CS seniors immediately went to inspect the page whereas the non-CS underclassmen seemed to not really know what was going on. Afterwards in debriefing with the playtesters, the non-CS underclassmen stated that they wouldn't have been able to make it through that part of the game as quickly or even at all if there wasn't someone who knew more about CS on the team. This made us realize that our game was suited for our target audience, and perhaps not to players outside of it, since the game, especially with this puzzle, would require a CS person to be playing.

The players, once they knew that they would be looking for numbers in a song, proceeded to Shazam the songs they didn't know and looked up the lyrics. We realized that this use of technology and the internet detracted from the puzzle and the game process that we wanted the players to go through, so we decided to limit internet usage to specific parts of the game and not the whole game.

One last takeaway was that the gamemaster, who was following a script, wasn't able to say many of the narrative-building lines because she didn't want to interrupt the flow that the players were in. They went from one puzzle to the next with little difficulty, besides the introduction of the whitepaper puzzle.

Playtesting the whole game with all of the parts was able to create a fun game experience, and all of the players were very into the game (both the puzzles and physical components) which showed this. After the game was finished, the players were telling us that the game was fun and that they would want their friends to try it out as well. One note is that the players were very competitive and speed-ran the entire puzzle to try to get the fastest time, which is the first thing they asked about when they were finished.

Changes Moving Forward
Overall, we realized that our game may have become too easy, especially for certain groups of players, so we decided to scale up the difficulty a little bit to match some previous iterations. We moved forward with making the puzzles a little more challenging:
- Website: added a 5th number to be decoded
- Whitepaper: added 2 more colors to be red herrings

We also made changes to the gamemaster script. We decided to try to minimize the speaking that the gamemaster does and flesh out the hint system that they may need, depending on the players.

Link to playtest video: https://youtu.be/w9XXxE_-FpM
Timestamps
- 2:44 "You know about blockchain" - players tried to do the crossword puzzle without the internet
- 4:13 "It may be the first letter" - players throughout playtests, this one included had the initial reaction of putting the first letter in from the crossword for the website

- 6:14 - everyone is working on the crossword using different avenues (phone, laptop, brain, letter)
- 6:31 "The title is are you a wikiwiz" - laughing from the players showed that they realized they had overlooked a crucial clue but now understood it
- 7:58 - 10:00 - there's a clear distinction between the CS seniors and the non-CS underclassmen in the way they approached and understood this puzzle
  - The CS seniors had a familiarity with navigating the HTML that the non-CS underclassmen didn't have
  - The CS seniors quickly solve the puzzle
- 11:35 - the gamemaster had to interject and interrupt the players to say the next set of instructions
- 13:55 - struggled to figure out how to fast forward the song
- 15:01 "look up the lyrics" - players looked up the lyrics to bypass working with the MP3 player
- 16:06 - players used Shazam to look up song they didn't know
- 17:55 - all players thinking together to figure out the riddle
- 19:20 "Yay!!" - unlocked the website

Playtest 5

We conducted one final playtest of the entire game to test the full flow with the changes we'd made across previous iterations. This was conducted with a group of four Stanford students (one of whom was in CS247G), none of which had played the game in any prior playtests.

Who playtested
1 Bioengineering senior (gamemaster)
1 CS coterm
1 Biology senior
1 Psychology senior

What was tested
This playtest was the final playtest, and the second time we were able to playtest our entire game altogether. It was also the most complete test of the inclusion of the gamemaster as we had added much more contextual information and formalized the final list of hints to be included with the gamemaster script.

The gamemaster had much more insight into the overall direction of the game with the changes that were made to the script. They could interject where necessary, rather than having only pre-scripted interjections. We included one CS student in the playtest but wanted to have the majority of players be non-CS students.

Observations
This game saw a much more complete picture of the gamemaster's role. The changes to their script gave them a far more complete overview of the game and its direction at different points and allowed for more natural involvement which kept the flow of the game moving more smoothly.

At two points in the game, the gamemaster interjected with a clarifying point, confirmation of a direction, or a pseudo-hint. This was great as it meant they understood the game more holistically and, from the script we provided, had a clear idea or where the game was (meant to be) going. It also kept the game moving along, which was important at these points.

Though we crafted this playtest to include one CS student, when it came to the first website (the puzzle we thought would potentially require a CS student's assistant), one of the non-CS students was actually the one who understood the hints first and guided the CS student to the correct solution. This was a surprise but great to see that we didn't necessarily need to require CS knowledge for playing of the game.

The game was completed well within the target time (46mins) but 6 hints were used. This was not, however, all of the hints that were on offer. And, as a result, the total adjusted time came out to 58mins, just under the 60min 'limit'.

However, in this vein, it was on the longer side again of the playtests we'd done and it meant that, unlike some other playtests, there were quite long periods where the gamemaster didn't do much other than listen. One of the three main players also lost interest at points throughout the game. She later said that the story and premise didn't appeal to her much. The other two players had also doubled down by this point, so she felt her involvement was no longer strictly necessary to complete the game. She said, "If

I don't care about Bitcoin, why would I play?" This a valid criticism, though the other two playtesters said they also did not know or care about Bitcoin but had a lot of fun playing the game.

Changes going forward

We added players and roles (though this did not directly come out of the game) to the start of the gamemaster script for inclusion in reading before the game started. Beyond that, this final playtest validated all of our changes up to this point as they got through the whole game without interjection from the game-makers (only communication between players and gamemasters). Also, they still came in with a playtime of 46 minutes - plus 12 minutes added for 6 hints given - just under our 60-minute limit! Perfect (in our opinion).

Link to playtest video: https://www.youtube.com/watch?v=ztvlFbI_H3c
Timestamps
- 0:00 - Gamemaster reads opening script
- 1:05 - Gamemaster distributes items
- 1:20 - Players read letter
- 1:50 - Multiprocessing of crossword puzzle
  - Distribution of tasks
- 2:40 - Payoff: Large crossword success
  - Biggest crossword word solved
- 2:47 - Players ask to be told final answer
  - They were unsure on their 2nd answer so asked to be told it
- 3:17 - Players find first website
- 4:02 - Players migrate to laptop to 'inspect'
- 4:30 - Players realize clicking buttons decreases attempts
- 4:50 - Gamemaster delivers hint they already knew
  - No time deduction made
- 4:58 - Gamemaster delivers 2nd hint
- 5:02 - CS major got it wrong
  - Non-CS major previously guessed the correct action but was shutdown by the CS major
  - Not what we had expected, but we were surprised to see this
- 5:42 - Players understanding effect of actions on grid
- 6:46 - Players struggle to unlock first box with right code
- 7:40 - Players struggle to understand importance of whitepaper clues
- 8:10 - Gamemaster delivers hint

- ○ Hint initially seemed unhelpful but eventually lead them to the right answer
- 8:52 - Players play around with potential timestamps
  - ○ Players singing along to songs playing on MP3 player
- 9:48 - Players unlock 2nd box and read riddle
- 11:00 - Riddle ideating
- 13:09 - Payoff: significance of code from 2nd website
  - ○ Realising it unlocks the Ledger

PUZZLE ITERATIONS

Each of the puzzles within our game were iterated multiple times based on conversations amongst our team as well as insights gleaned from various play tests in and outside of class. Below we have detailed all of the major changes to each of the puzzles from the very beginning to the final version along with images that document the changes.

Opening letter

- Version 0
  - We created a letter that mimics the Stanford branding. We wanted to use this to create a personality for Satoshi and set the tone for the rest of the game. We hope to convey the message that Satoshi is actually a Stanford professor who recently passed away.

Dear Students,

If this letter finds its way to you, I'm dead. Most of you may not know me and for good reasons. For many years, I've served as an EE and CS professor at the School of Engineering. But there is an alternate identity that I've withheld until now – an identity that some of you might find surprising.

I am Satoshi Nakamoto, the creator of Bitcoin.

I've long been a silent observer, witnessing the transformational journey of this revolutionary digital currency from a simple idea to a global phenomenon. The concept of Bitcoin, born out of a vision to democratize finance, has introduced the world to the revolutionary potential of blockchain technology.

However, in the past few years, I have been disappointed at how people misuse this technology and detract from my vision of democratizing assets and value creation and distribution. I know I don't have much time left, but I want to entrust the future of this industry into the hands of the next generation - you.

I have left all my Bitcoin assets in a hardware ledger and designed a series of puzzles around it. Those who are capable of solving these puzzles may inherit all of my Bitcoin assets which are worth about $42 Billion (depending on how far the Fed keeps messing up the inflation).

Sincerely,

Andy Lee '86
Knight-Levine Professor of Electrical Engineering and Computer Science

- Version 1

○ We fine-tuned the language and grammar of the letter to make it sound more like a Stanford professor. In addition, we preserved the personalities that we wanted to include for Satoshi.

Stanford University — School of Engineering

Dear Students,

If this letter finds its way to you, I'm dead. Most of you may not know me and for good reasons. For many years, I've served as an EE and CS professor at the School of Engineering. But there is an alternate identity that I've withheld until now – an identity that some of you might find surprising.

I am Satoshi Nakamoto, the creator of Bitcoin.

I have been a silent observer, witnessing the transformational journey of this revolutionary digital currency from a simple idea to a global phenomenon. The concept of Bitcoin, born out of the vision to democratize finance, has introduced the world to the revolutionary potential of blockchain technology.

However, in the past few years, I have been disappointed by the people who have misused this technology and detract it from the its original vision of democratizing assets and making wealth distribution more accessible to everyone. I don't have much time left and I couldn't do much with my energy like I used to. But I want to entrust the future of this industry into the hands of the next generation - you.

I have left all my Bitcoin assets in a hardware crypto wallet, Ledger, and designed a series of puzzles around it. Those who are capable of solving these puzzles may inherit all of my Bitcoin assets which are worth about $42 Billion (depending on how far the Fed keeps messing up the inflation). To the moon!
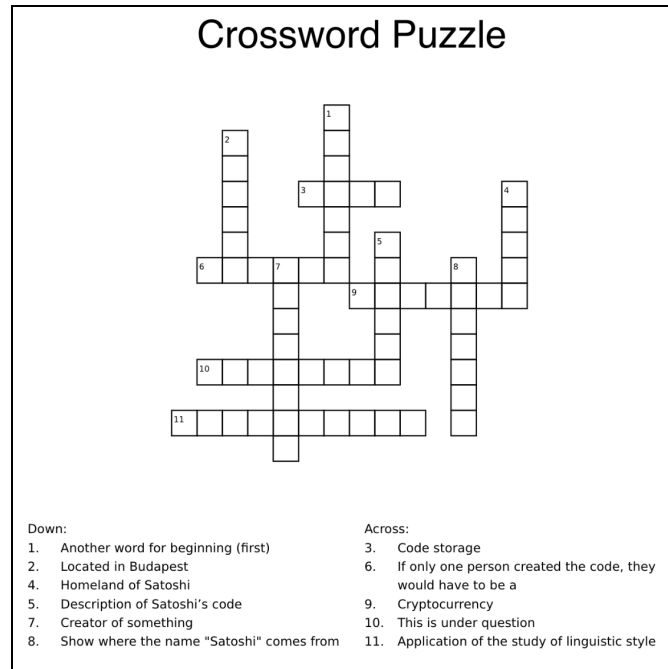
Sincerely,

Andy Lee '86
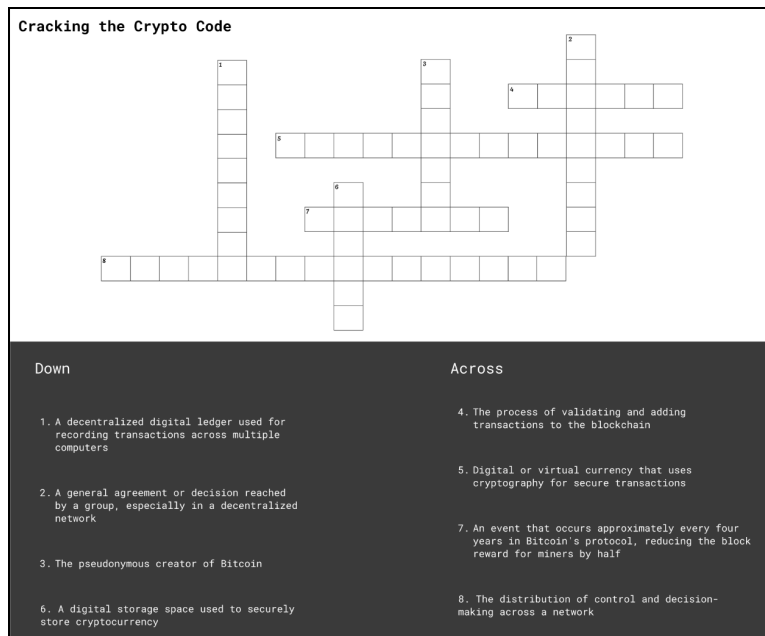Knight-Levine Professor of Electrical Engineering and Computer Science

School of Engineering
475 Via Ortega, Stanford, CA 94305

Crossword
- Version 0
  - The initial version included 11 words
  - Used version generated by crossword generator (shown below)
  - All words and clues were taken from the Satoshi Nakamoto Wikipedia page

Crossword Puzzle

Down:
1. Another word for beginning (first)
2. Located in Budapest
4. Homeland of Satoshi
5. Description of Satoshi's code
7. Creator of something
8. Show where the name "Satoshi" comes from

Across:
3. Code storage
6. If only one person created the code, they would have to be a
9. Cryptocurrency
10. This is under question
11. Application of the study of linguistic style

- Version 1
  - To lead players to the Wikipedia page, we added the clue "they wiki wish they were me" at the top of the crossword
  - Wanted to have embedded clues as opposed to specific hints
- Version 2
  - Crossword was too long
  - Shorten crossword from 11 words to 8 words
  - Changed clues were about cryptocurrency in general as opposed to being taken from the Satoshi Nakamoto Wikipedia page. Additionally, we made a higher fidelity version in Figma (shown below).

Cracking the Crypto Code

Down

1. A decentralized digital ledger used for recording transactions across multiple computers

2. A general agreement or decision reached by a group, especially in a decentralized network

3. The pseudonymous creator of Bitcoin

6. A digital storage space used to securely store cryptocurrency

Across

4. The process of validating and adding transactions to the blockchain

5. Digital or virtual currency that uses cryptography for secure transactions

7. An event that occurs approximately every four years in Bitcoin's protocol, reducing the block reward for miners by half

8. The distribution of control and decision-making across a network

- Version 3
  - Further, reduce the number of clues from 8 to 6, and return to using clues from the Satoshi Nakamoto Wikipedia
  - Added new header that said, "Cracking Satoshi's Code: they wikiwish they were me" with the hopes that the Satoshi in the header would lead players to the Satoshi Nakamoto Wikipedia
- Version 4
  - "wikiwish" clue didn't work, so we added the Wikipedia logo and included the hint shown below where players were to fill in the blanks with the words corresponding to each clue from the crossword puzzle.
  - Decided to help players by filling in the first letter of each word in the crossword

bit.ly/ _____ _____ _____ _____ _____ _____
         4   6   3   1   2   5
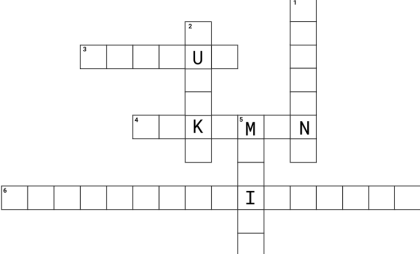
- Version 5
  - Blanks became representative of the first letters of the crossword answers
  - Pre-filled in any of the letters where words intersected hange which letters we pre-filled in the crossword since we no longer wanted to give players

the first letters for the words that could be used to get to the next puzzle without solving the crossword. Instead, we pre-filled in any of the letters where words intersected.

- Version 6
  - Our final version (shown below) included a new header with the phrase "wiki-whiz" to point players to the Wikipedia page as well as a note that this was the only challenge where players could search the Internet.

Cracking Satoshi's Code
Are you a Wiki-whiz?
(For this challenge and this challenge alone, you may search the Internet...)

[Crossword grid with pre-filled letters: U, K, M, N, I]

Down

1. An event that occurs ~4 years in Bitcoin's protocol, reducing the block reward for miners by half

2. Description of Satoshi's code

5. The process of validating and adding transactions to the blockchain

Across

3. Located in Budapest

4. Show where the name Satoshi's comes from

6. The distribution of control and decision-making across a network

bit.ly/ ___ ___ ___ ___ ___ ___
       4   6   3   1   2   5

Inspect Website

- Version 1
  - We had a website that is composed of a timer, the number of tries left, and the phrase "Inspect today, perfect tomorrow".
  - The timer just runs down from 10 minutes down to 0. When 0 is hit, the website alarms the user with a message that goes "You have failed me and don't deserve my legacy".
  - The phrase was short and quoted as if it came from Satoshi. But it was vague and does not necessarily give enough information for the players to understand what is happening on the website and what they are required to do in order to solve the puzzle.

○ In the inspect elements, the clues were given without any context, which may be too difficult again for the user to make sense of.

00:00:09:40

You have 5 tries left

Inspect Today, Perfect Tomorrow.

● Version 2
  ○ We added more variations of the clues in the inspect element.
  ○ We added "Lightning McQueen", and "Cristino Ronaldo." The idea is that the number of Lightning Mcqueen is 95, and the number of Cristino Ronaldo is 7. Both of these numbers can be found on the keypad. This is because we want to incorporate more models for solving this puzzle. The previous mechanism was very obvious that the results were coordinates. So we wanted to take advantage of the numbers that we can include on the buttons.

00:00:09:52

- Version 3
  - We removed the timer, added descriptions in the inspect elements, and implemented an intuitive UI to show help with the password-entering process
  - We added a "personal journal" component. It includes hints about solving the puzzle and gives insight into Satoshi's past experiences.
  - In the inspect section, we added more notes to provide hints about the coordinate systems.
  - We also removed the "Lightning Mcqueen" and "Cristino Ronaldo" because they are not necessarily related to the storytelling. Instead, we added the "Satoshi's class year" which can be found in the opening letter, and the "Bitcoin Halving Time" which is a part of the Crossword puzzle.

Whitepaper
Versions linked:
https://drive.google.com/drive/folders/1z0aK0BiiF1m47i2DmEmVRZhnHKN0er1h?usp=sharing

- Version 0/Version 1
  - Started off with the idea of using ROYGBIV colors or the lack of one of the colors being used in the title in order to draw attention to the important color
  - Yellow was the missing color
  - The things highlighted in yellow were important
    - Could've been a code

- ■ Chose to make it a timestamp since our group had mentioned wanting to use a video in our game flow
  - ○ Highlighted Timestamp in yellow
  - ○ Highlighted 3 numbers in order to act as a timestamp
  - ○ Every other highlight color/item was a red herring
- Version 2
  - ○ Combined this puzzle with the idea of using songs to hint at a clue
  - ○ Used 3 colors to highlight timestamps in order to make these the important colors
  - ○ Used 3 colors to highlight timestamps for 3 songs
  - ○ Still had many red herrings to make the puzzle harder
    - ■ Players needed to parse through to find the correct color and ignore the incorrect colors
  - ○ Players thought it was still too difficult
    - ■ Needed multiple hints
- Version 3
  - ○ Removed excess colors (red herrings)
  - ○ Only used 3 colors which highlighted 'Timestamp', the main 1, 2, 3 which link to the songs in the MP3, and the timestamp numbers
  - ○ Players still took a long time working through this puzzle
    - ■ Got the first timestamp relatively quickly
    - ■ Went back and forth between finding color/timestamps and the MP3
    - ■ Used multiple hints
  - ○ For the MP3, the players got confused about some of the numbers
    - ■ Change songs to have clearer numbers
- Version 4
  - ○ Maintained the no red herrings version, only the 3 main colors
  - ○ Changed songs to have easier-to-understand numbers at the timestamps
  - ○ Players bypassed listening to songs and looked up lyrics
    - ■ Guessed, accurately, what the number would be given the timestamp and the lyrics
  - ○ Had some difficulty with the physical component, fast forwarding in the MP3
  - ○ Overall, the puzzle was too easy
- Version 5
  - ○ Added back in some red herrings (different colors)
  - ○ Added rule that the internet shouldn't be used for this puzzle
    - ■ No looking up lyrics

Riddle
- Initially started with a riddle that was too hard
  - The last line was missing
  - Players needed to guess the last line basically based only on the rhyming structure and the 'vibe' of the riddle
  - All that mattered was the number of letters in each word from this final line
- This playtested as being too hard.
  - Added hint system. Hangman-like clues showing how many letters were in each word. At this point, they didn't know the letter count was important so it didn't give too much away.
- Through playtests it became clear there was a line where it suddenly went from too hard to too easy. This line was when the letter counts were introduced.
- We decided to switch from the idea of the riddle being the hardest puzzle to it being a culmination/wrap-up of the vibe we were trying to curate.
  - This involved changing the riddle entirely to make it more riddle-like, rather than a guessing game.
  - This made it become easier, but far more consistent in each playtest.
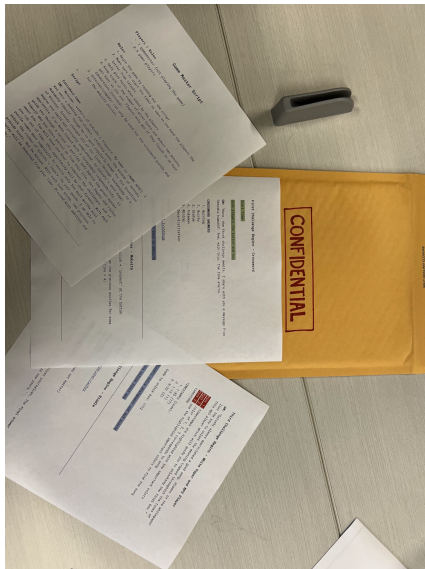
Final website
- Originally the riddle was constructed in a way that the number of letters in each of the 4 words you had to guess would give the code to the ledger.
  - However, this made the writing of the riddle particularly difficult and we had no way of giving feedback to the user while they were attempting to solve it.
  - We felt a return to a website would be a good way to manage this state internally.
- First, when the final website was first introduced we removed the ledger from the game.
  - However, the payoff didn't feel big enough.
  - Players also really enjoyed the tactile elements of the physical items
- We reintroduced the ledger
  - Players didn't seem to mind anything about the design of the website once the ledger was reintroduced

GAME

Link to Print-n-Play:

📄 PrintAndPlay.pdf

Final Fidelity Images

FULL-LENGTH PLAYTEST VIDEO

Link: https://youtu.be/w9XXxE_-FpM