ACR254 AT2 Game Design Document
The Two-Sided Mirror

Jai Wats, Taine Markley, Siu Hang Fong, Sean Sun

Vision, Scope and Goal of the project

The goal of the project is to create a platformer with a resource management mechanic built into the mechanics of the game. So, we are utilizing a mechanic where in the player will be able to decide what blocks are dangerous to the player but adding a resource management into the game where in the player can't just infinitely change because they are limited by the mana which will be replenished every few stages. The goal of doing this is to make players think of their decisions and to make for an experience where the player feels repercussions for their recklessness early in the game. It will make for a game with consequences but a great feeling of satisfaction when the player completes the game and that is what the main goal of the project is at the end of the day.

Team contributions

Jai Wats – Developer, programmer, Main Tester and concept creator for the game

Taine Markley – Designer, Agile master, Team organizer, Asset designer

Sean Sun - Game Art Designer, UI designer

Siu Hang Fong – Game Art Designer, UI designer

Key Requirement Summary

Design – the most important things that were designed in this project were the levels, resource systems, and the player controls. These all went hand in hand to creating a cohesive game experience and make up the core gameplay, with each one impacting heavily on the other design choices made within the game. Specific choices were made when designing each aspect, for example how quickly you would lose health when standing on a different colored platform, or what colors would be used for platforms within a level to make it easier or more challenging. These choices were discussed and tested until we felt we had successfully made fun and fair designs for the game.

Technology – The game was mainly built utilizing unity as the game engine; all other assets and programming were implemented into this unity project. Discord was used as a way for the team to communicate, sharing files, sending messages, and holding meetings to aid in completing the project. Programs were also utilized to create the assets within the game, such as Aseprite which was used to create the platform designs.

People – This game project is developed by Jai Wats, Tain Markley, Sean Sun and Siu Hang Fong. Jai Wats is the main developer of the whole game project, who created the main concept for the game and worked on the game programming and testing. Taine Markley is one of the game designers for the game, who also acts as the team organizer and the game asset designer. Sean Sun is the main game level designer, who helps develop and design each level of the game stages. Siu Hang Fong is the game art and UI designer for the game, who creates the artwork of the game and makes the user-friendly UI for the player to learn the control of the game.

Timeframe – We started the project on August 12th and intended to complete the prototype for the game by the 27th of September, but that plan got delayed because of other factors but we still ended up finishing by the 29th of September in the end that means we completed the games prototype in 48 days (about 1 and a half months) which is pretty close to the actual time we intended to complete it by. We finished 1 worksheet per week every Thursday and work a bit on the games slowly adding in a mechanic per week. We finished all the worksheets and the documentation by 20th of September and could do pure work on the prototype for 9 days.

Concept summary

Title and Tagline - The title of the game is “The Two-Sided Mirror” with the tagline “Everything has two sides” with these being in reference to the game’s main mechanic.

Gameplay hook - This main mechanic is being able to switch between two colors, black and white, which serves as the game’s primary gameplay hook. The switching between colors would allow us to create challenging and interesting levels and gameplay loops for players to platform through, as they attempt to complete each section of the game.

Genre - The genre of the game is casual platformer, as to complete the game the player must maneuver through the levels, being sure to avoid damage they receive from platforms with the wrong color.

Theme - The main theme to the game is the disposition between the light and dark, giving a stylistic feeling to the game that is reminiscent of hollow knight, one of the inspirations for the game. Color is used very sparingly throughout the game to keep in line with this theme, however color would be used to communicate important information, such as the health and mana on the UI as these are the main resources used within the game, and spikes that kill the player on contact.

Platform - The main platform this game would be designed for is an at home PC, as this is the platform that would give players most control over their character, as well as being one of the largest gaming audiences of all platforms, meaning there would be many potential players.

Target audience analysis

The primary audience for this game is players from the age of 12 to 18 years old of any gender. This game targets those who have played games before and are seeking a challenging experience. The game aims to draw them in by challenging them to complete all the levels, taking as little damage as possible.

The secondary audience is adults between 25 and 30 years old also of any gender. This serves as a good market as there are many adults who enjoy competitive and challenging games. This game attempts to appeal to this audience as a game that is fun, and easy to pick up and put down, not requiring a large time commitment from them, which may work better for adults who do not have as much time to play games.

The tertiary audience of the game is children between the ages of 5 to 10 years old with an even split between genders. These children serve as a small part of the potential audience as there are some kids who are interested in challenging themselves with harder games, rather than the typical easy games designed for kids. Kids also have a lot of time to spend gaming, so this game would appeal to them to spend their time

Game setting and story

This game takes place in a world known as Impurna, or in other words the world of togetherness, however the world is anything but together. There are 2 tribes in this world one is known by the names of Lumina (Tribe of light) and Teneb(Tribe of dark). Both tribes have adapted over the years to different environments, the people of the Lumina tribe are blessed by the light and traverse through the light blocks which are white in color in the game while the darkness or black blocks in the game harm them. On the other hand, the Teneb tribe are blessed by darkness and are given the ability to traverse the darkness and go on dark blocks with no repressions however the light harms them. Our protagonist is born in the Teneb tribe however he never met his mother, and the towns people don't talk about her much and the protagonist's father also never brings up the topic. Until one day the kid stumbles upon a mirror left by his mother and sees a photo of a Lumina tribe individual in front of it. When the kid asks about this to his father. His father is very hesitant but ends up eventually revealing his mother was from the Lumina tribe and that mirror was the last thing she left before abandoning them. When the kid hears this, he has extreme emotions flowing through him as he starts crying, he feels extreme pain and begins to change form into a Lumina tribe member. When the townspeople see this, they are shocked and don't say anything until the kid sees he is standing on a dark block and begins feeling immense pain and falls. The mirror automatically reacts and changes him back into a Teneb. After waking up to his father crying. He sees the mirror and runs away thinking that he did something wrong. He sees that his mother's mirror has begun to follow him, he doesn't understand why but he just runs. He runs away from the Teneb tribe to get answers and this game follows his journey. Traversing through the world of Impurna and what the kid will find on his journey.

Gameplay system

The game play system in this game is easy essentially the player can utilize the mirror at the beginning of the stages to traverse terrain of the other color via changing his on color. The player is given a certain number of changes per 5 stages in most cases being limited to 2 changes every 5 levels. Players will respawn at the beginning of the last 5 stages whenever they die because you need to flow through the stages seamlessly and we can't be nasty to players putting them in an infinite loop of suffering for one mistake. But that is the essential deal, it's the goal of the player to reach the end of the stages.

Worksheet 1 summary

Feedback and Internal Economy worksheet

This worksheet allowed us to define the feedback our players receive from the internal economy of the game.

There are only 2 resources that are used throughout the game in the internal economy, those being Health and Mana. Mana can be spent manually, while health is a persistent resource that is only interacted with when the player receives damage or receives some health at the beginning of certain levels.

Health determines whether the character survives the level, as such it is the most important resource the player has. The player receives negative feedback from standing on a wrongly colored platform through their health being drained, showing a form of static friction within the game. This health drain provides the player with a sense of urgency to move from the platform they are on, and to encourage them to play smartly to lose as little life as possible.

The other resource that exists within the game is mana, which determines how many times the player can switch colors. The player is given positive feedback for spending their mana wisely as it allows the player to preserve their life, however the player is given negative feedback if they spend too much mana, as they are only given two color changes for every five levels, showing a static engine pattern. This results in players being encouraged to spend their mana wisely, and to only switch colors when a level would be extremely difficult to complete otherwise.

A major part of implementing the negative feedback from standing on the wrong platform for too long would be deciding what rate to drain the health at. Too quick and players are extremely punished for small mistakes, too slowly and the game would not be challenging enough. As such, this friction pattern of draining health greatly contributes to the game's difficulty and enjoyment.

Worksheet 2 summary

Feedback and balance worksheet

Feedback Mechanisms:

--The game contains several different types of feedback mechanics, including positive, negative, and neutral feedback.

--Positive feedback consists of mana restoration and LifePoint restoration to reward the player's skills and successful completion of the level.

--Negative feedback involves the player losing life points due to incorrect use of mana, encouraging better management of resources.

--Neutral feedback relates to changes in character color that may increase or decrease the difficulty of the level, depending on the player's choices and strategy.

Balance Considerations:

--The game is considered to be very fair, with no randomization mechanisms, relying solely on the player's skills and actions to complete the levels.

--Feedback mechanics are appropriately placed in the game, rewarding the player's skills while also penalizing failure.

Stability:

--The game is highly stable as the game mechanics and feedback remain consistent and do not change as the game progresses.

Engagement:

--The game maintains player engagement through simple mechanics and gradually increasing difficulty.

--The game's colors and audio cues help to provide information that affects the player's fair and stable gaming experience.

Game Difficulty:

--The difficulty of the game is relatively fixed and the player needs to make informed decisions in terms of choosing platform colors and managing resources.

--Players need to manage mana and health resources during the game, so they must always be alert and carefully consider their decisions for each level.

User Testing:

--The documentation mentions a plan for user testing using the USE model.

--Testing includes testing whether players understand the importance of mana particles, testing whether game mechanics are determined based on user interaction, and testing whether players can learn to navigate through the game and understand the costs and benefits of the chosen format.

--The results of the testing will be documented and analyzed in detail once the testing is complete.

Art design

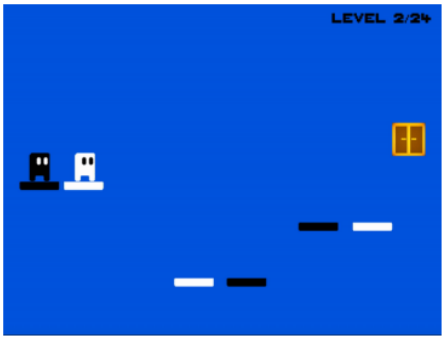
About the game art design, we focus on making it simple and interesting, in order to make the game easy to understand and also looks fun to play during the play through. As our game named as “The Two-Sided Mirror”, the two main colors of the game are focus on black and white. These two colors will heavily affect the players during their gameplay due to the game mechanics. To make the game graphics look interesting by using these two main colors, we tried to make them in different shapes, to let the players feel different and intriguing to play on our game.

Reference Art

For the reference art, we choose to create our game art style by referencing the games like “Hollow Knight”, “Unworthy” and “Black & White”. The common points of their art style are mostly black and white as the main tone, also simple and interesting for the look of their game, which are very close to the idea of our game style concept.

(Hollow Knight, https://www.hollowknight.com/)

(Unworthy, https://www.pcgamer.com/black-and-white-2d-action-game-unworthy-is-out-now-and-worth-yourtime/)

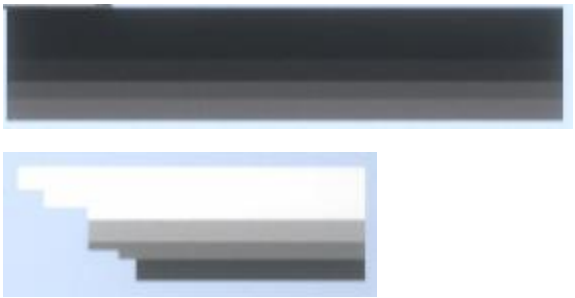


(Black & White, https://www.coolmathgames.com/blog/how-to-play-black-and-white-color-coded-fun)

Concept Art

In our concept art, we create a few assets which are close to our gameplay idea and mechanics, such as the black and white platform, mirrors and the traps.

About the black and white platforms, they act as the main mechanic of our game. We make them in different shapes and sizes, that makes the game stage look interesting and easy for the player to know where to go during the gameplay.



(Image 1. Black and White platforms)

For the mirrors, they are the main part of our game, because the theme of our whole game design is about the mirror. Therefore, we create two different mirrors for each different mechanic in our game. The mirror below acts as the color changer for the player to change their character color at the start of the stage, which may help the player process the stage more easily during the gameplay.

(Image 2. Color Changer)

This is the gate mirror, which will appear at the end of the stages. When the player successfully touches the gate mirror, it will transfer the player to the next stage. Therefore, we made it look bigger than the color changer mirror and in different shapes, that can make the player know the difference between two mirrors, and let the player know they successfully reach the end of the stage. Also, we made it into two more colors, which are black and white, to tell the player which color of the platform they are going to start in the next stage.

(Image 3. Gate Mirror)

(Image 4. Gate Mirror [Black])

(Image 5. Gate Mirror [White])

The image below is our main game character, the player will control it to challenge through different stages in the game. It has two different color versions, which are black and white. Players can change their character color at the color changer any time while they have the mana to do it.

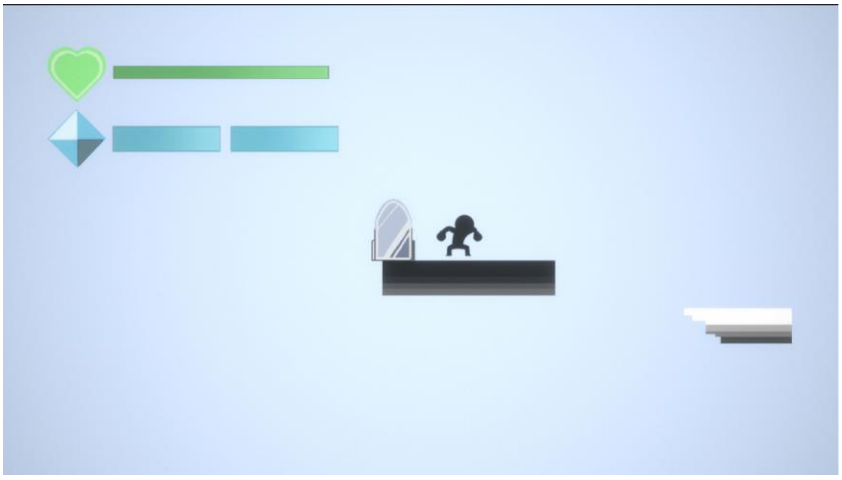
(Image 6. Game character)

Audio Direction

About the audio, we add different sound effects in the game and background music, to make the game feel more alive and interesting. Such as the jumping sound, the character taking damage sound, player character dying sound and so on. These sound effects will give the player direct feedback about their situation in the game and make the player can be more immersive to the game. Also, we add the 16-bit version of the background music, to make the game more interesting to listen to and make the player feel more excited to play.

UI interface

In UI Design, we make a few UI in the game, and focus on making them simple and easy to know, that make player having enough information and not overwhelming them during the gameplay. Such as Health Point bar and Mana bar, these two resources will affect the player actions during the gameplay. To make the player quickly understand the character's status in the game, these two resources will be shown on the top left corner of the screen.



(Image 6. Gameplay scene with Health and Mana bar UI)

About the design of the health bar, we make it in green color. It is because most of the game in the game industry, green color is represented as the health resources, which can make the player can quickly acknowledge that this bar will affect the character's health during the gameplay, even it is the first time the player plays our game. Furthermore, to make it easier to know this is the health bar, we added a green heart as the health icon beside the health bar.

(Image 7. Health icon)

(Image 8. Health bar)

And the mana bar, we make it in blue color and also adding a blue gem icon beside the bar. As same as the health bar, it represents the resources that the play can change the character color in the game.

(Image 9. Mana icon)

(Image 10. Mana bar)

Level design

Level design plays a crucial role in game development as it offers players an engaging and enjoyable gaming experience. Achieving the right balance of difficulty is essential in level design. I had to ensure that the game's challenge gradually escalated, testing the player's skills without causing excessive frustration. In our game, the initial two levels consisted of distinct colors while avoiding overly intricate designs that could lead to player frustration. Additionally, there were minimal traps incorporated into these levels. However, as players progress further into the game, they will encounter heightened difficulty in terms of both platform distribution and overall challenge. Furthermore, with increased difficulty comes a greater number of traps strategically placed throughout more challenging areas on the map.

Technical Design

In terms of how the gams technical design functions we used code to implement the logic and mechanics of the game. The specific language used in this case was c# because we made the game on unity. We began by using the basic character template of the default character provided then we added the ability to change colors via the usage of a true false value we deemed black. Whenever Balck was true the player character was black and whenever Black was false player character was white in color. True are false values are Boolean so this will be efficient on the commuter if we use the Booleans for implementing the damage system as well which is what we did in this case. To put in level changes into the game we did a teleport deal this was also to make use the Hp, and mana values are more

manipulatable and carry on to some degree. We also employed techniques like hiding objects like the mama pellet on contact to make sure that we can re-use it at later levels. On the aspects of how this fit into our design we ended up utilizing the logic to build the whole game which allowed us to focus on how levels function and how the dage can be distributed to make player work to reach the final level and reaching the end.

Appendices

Feedback and Internal Economy Worksheet and Checklist

Review the internal economy and feedback mechanisms identified for your game design in the Rules Worksheet. Update these in the table below to reflect refinements made while creating your game.

Resources used in the Internal Economy

Name of resource	How it is used in the game
Health	*The player has health and this determines whether the player will live or not. The player loses health if they go on platforms that don't match with their color and reaching 0 health results in the level needing to be replayed again. A small amount is regained upon completing a level.*
Mana	*The player spends mana to change the color of their character in accordance to the platforms they encounter, it can only be regained through pellets given every few levels.*

Feedback mechanisms

Type of feedback (positive/negative/random)	Input resources (amount of feedback depends on quantity of these resources)	Output resources (resource whose level is changed as a result of this feedback)	Goal of this feedback mechanism

Positive	*Mana*	*Mana*	*The player is able to use mana in order to change their color which will make certain stages easier to play. Good resource management is rewarded with the promise of making levels more manageable to play and will be the difference between life and death.*
Negative	*Health*	*Health*	*The player will lose health, if they fail to match the platform color. The game will be over when the player loses all of their health and needs to restart the level again.*
Negative	Mana	Mana, Health	We will only provide the player limited amount of mana to change 2 times and we only give mana pellets to replenish your mana once every 5 levels which will punish frivolous speeding of mana by having players give

			up health in most cases because they where the wrong color in the wrong level.

Part 2: Economy

Undertake the exercises below. If none of these are relevant then identify the reasons why and suggest strategies for providing equivalent rigor to your game setting.

Identify any of the economic patterns in your game design and confirm that their role matches your original design intention. Consult module 2 for further information on economic patterns.

The Static Friction pattern exists within the game with the health system. When standing on a platform with the incorrect color selected, the player's health is drained at a constant rate to reduce the time the player can remain on the platform or in the color they have chosen. This ensures a sense of urgency to either move from the platform or spend mana to switch colors and stop the health drain.
The Static Engine pattern can also be observed within the game. Mana can be spent within the level to change the color of the player to match the color of the platforms, in doing so Health is preserved throughout the level, and if the player can reach the end of the level without taking damage due to this health preservation, they can overall gain health.(Health is capped at max capacity).

Reflect: Have you discovered any extra insight into your game structure through identifying formal patterns present in it, or alternatively: are you considering incorporating a formal pattern into the game design to manipulate the internal economy in a particular way?

We are incorporating the Static Friction pattern in terms of draining health when standing on a platform with an incorrect color. We will test and implement different rates of health drain, this is in order to manipulate how the player values both mana health, changing how much health the player is willing to lose to preserve their mana, and vice versa. This internal economy contributes greatly to the challenge of the game so implementing the best ratio of time to drain through the Friction pattern will greatly impact the game.

Feedback and Balance Worksheet and Checklist

Review the feedback mechanisms identified for your game design in the Rules Worksheet. Update these in the table below to reflect refinements made while creating your game.

Feedback mechanisms

Type of feedback (positive/negative/random)	Input resources (amount of feedback depends on quantity of these resources)	Output resources (resource whose level is changed as a result of this feedback)	Goal of this feedback mechanism
positive	*Mana restoration*	*Mana*	*Can restore mana when in contact with mana pellets*

Negative	Health Points	Health Points	To punish the player for incorrect utilization of their mana to match the colours of the platform they land on, health is drained from the player. Encourages better management of mana to avoid loss of health points.
positive	restoration of Health Points when level completed	Health Points	Health points restore by little when the player completes the level. This will reward players who complete levels with no damage as instead of continuing damage from a past mistake you restore health for later usage.
Neutral	Change of Color's via the usage of the mirror at the beginning of the level	Character Color, mana, health	Well this is a neutral feedback as the character changing color can make certain levels harder and others easier so depending on player choice one is rewarded or punished because of chosen color for mana spent. It in most cases can also cost health or save health for later

			usage depending on how it's used.

Balance considerations

Describe your game in terms of fairness? What attributes (feedback, mechanics, action) make it fair?

There are no randomized mechanics or actions within the game, meaning the game is completely fair and based purely on the players ability to complete levels with their own skill and mastery of the actions presented to them, with failure to utilize the skills receiving negative feedback through the health and mana resources.

Are the feedback mechanisms described above well placed throughout the game?

Yes, players are rewarded for their skill through positive feedback, such as health preservation, health regeneration, and mans replenishment, and punished for failure through the negative feedback, such as losing health or dying.

Describe your game in terms of stability? What attributes (feedback, mechanics, action) make it stable?

The game is very stable, as the mechanics and feedback given to the player remain constant throughout the game, resulting in a game experience where balance is always preserved in terms of the actions the player can take and mechanics the levels employ.

How are resources managed for each player? Are the feedback mechanisms described above well placed throughout the game?

Health is managed by spending mana to avoid health loss due to being the wrong colour for the platform the player is on, as well as avoiding the obstacles and pits. Mana is managed by the player choosing when to spend the limited resource in order to change their colour. The feedback mechanisms exist in all levels of the game, so the player is receiving constant feedback on how they are managing their resources, leading to them feeling well placed throughout the game.

Describe your game in terms of engagement? What attributes (feedback, mechanics, action) make it engaging?

The Game is engaging through its increasing difficulty and simple mechanics. The simple mechanics of swapping colours and moving through the level and clear feedback make the game easy to understand for players of all levels, making the game easy to pick up and engage with. The increasing difficulty of the game building on these simple mechanics to further challenge the player keeps the game engaging, as players attempt to conquer the negative feedback they receive from the harder levels.

What considerations have been made for providing engagement as a component of a fair and balanced game? How are audio and visual cues used to provide information to the game player that may impact upon their fair and stable game experience?

Considerations on how to implement the increasing difficulty have been made to keep the difficulty of the levels relative to the experience and ability of the player at any given time, this ensures a fair and balanced game that challenges the player, but not so much that they can't complete each level they are presented. Visual information is perhaps the most impactful part of the game for creating a fair game, the colours of the player and platforms are clearly communicated through the opposing shades of black and white making it clear what platforms are safe or dangerous to the players current state. Audio cues provide further feedback to the player that their actions have been inputted and completed, aiding a fair and stable game experience as the player gets confirmation of the inputs they are giving the game.

Difficulty of your game

Absolute difficulty	*Relative Difficulty*	*Perceived difficulty*,
The player needs to make decisions on the choice of their colour for the platforms in the level. They are only given enough mana for 2 changes before the mana has to be restored using mana pellets.	Players will take damage for being on the wrong block and picking the wrong Color for the situation. The player on average is only given 2 charges for every 5 levels and only given enough health to survive 1.5 levels worth of damage. So resources in the worse case scenario if you aren't careful and have no levels where the you take no damage is only enough for 3.5 - 4 levels in total. Instead of 5.	Players have to be on their toes all the time and think carefully for every level considering that they are managing 2 resources at all times and not having balance between the will affect future levels and your ability to complete them with success.

User testing

Refer back to SIT254-PlayerPsychologyWorksheetAndChecklist completed for your game, specifically the goals and psychological techniques employed. Using the USE model (Figure 1) describe how you will be testing each characteristic for your game.

Figure 1. USE Model

User

Description of user element to be tested	Testing method	Plans for testing	Outcomes
Player learns the importance of mana pellets	*Operant conditioning*	*We test it by making a mini stage for the users and survey them on what they think the specific items like mana pellets do and note results*	*Our testing on the survey shows a high level of frustration with the idea of being slowed down by blocks when the damage is already so much. We will keep the damage but remove the slow effect.*

System

Description of system element to be tested	Testing method	Plans for testing	Outcomes
Determination of game mechanics based on user interaction	*Heuristic Evaluation*	*Construct a play-testing sessions and a user survey that investigates the level design of user testing*	*The players liked the game and gave us some feedback on how the mirrors should be the color of the next stages first platform to make the next actions less nasty.*

Experience

Description of experience element to be tested	Testing method	Plans for testing	Outcomes

If player learns how to navigate through levels understanding cost and benefits of the form they choose in the game	*Flow Theory*	*Conduct a play-testing session and ask players to rate on a scale their perceived level of flow. Use flow theory measure to help with this process.*	*The flow of the game was typically rated between a 9 and 10 on average but that is more to do with the strait forward progression of the platformer than anything else.*

Game Theory and Strategy Worksheet and Checklist

Your game design should require that players have alternative strategies available to them. This can occur at multiple levels in the design. For example: low level strategies may involve deciding on whether to move a game character to the left or to the right. Alternatively examples of longer term strategies may include deciding on how much gold to collect to allow you to buy more powerful equipment as opposed to embarking on the quest immediately with only basic equipment before all the good treasure is taken.

Different sides may have the same strategies available or different ones (compare a 2 player symmetric game to a game between a player and AI controlled monsters for example).

Strategies

Consider one context in your game where different strategies can be employed. For two (or more) parties in the game, list the alternative strategies available to each of them.

Identify the utility (value) provided to each party for each combination of strategies used by opposing sides. Recall that utility represents the value received by each party. It may be a 1 or -1 representing a win or loss. It may be a number representing the level of reward achieved such as final score or the amount of treasure collected.

Utility can be calculated directly if the value and probability of each outcome is known (see the material from class on probability and utility). Simulation of the game is another way to work out the value that each party receives (such as final scores). When working with high level abstract representations of the game then an estimate supported by reasoning is an acceptable way to provide these values.

*1.*To change colors when you see a level would be impossible to play or will require the taking of too much damage to play with a specific color

2. Take damage when necessary but make a quick movement to reduce the amount you will take. Example if there is one block that is the wrong color, and you must go on it make sure you go on it for as little time as possible to preserve maximum health.

3. Use mana only when necessary to make sure you can change when actually required.

4. Use mana to preserve health before you get your next mana pellet as a mana pellet restores you to full health.

5. In certain cases if you have taken damage try completing levels with no damage to recover back some lost health.

The main obstacle of the game is the different platforms and layouts of the game, so there can be different kinds of strategies when designing levels

1. Using a single color for the platforms within a level
2. Using an equal mix of colored platforms in a level
3. Using mostly a single color for platforms in a level

Change Strategy/Level design	Single Color	Equal Mix	Mostly one colour
Choosing good colour changes	You can complete the level most definitely with a good colour change even if you lack a bit in the skill department. But going of pure colour changes this strategy will allow you to complete the needed 5 levels before you	Well for these levels you would just stay on the colour you are cause they can be completed with either levels so this strategy won't add anything to this type of level.	So in this case choosing a good colour can be beneficial but if you spend mana where not necessary it will cost you in a later level.

	get the mana to do more changes.		
Preserving Mana(via using HP)	In single colour levels you shouldnt be stingy with mana as they can be completed with one specific colour only and the damage will be so much that you will not have a chance to even complete on level.	Using no mana is good here because it would make no sense to do so.	In this case the damage taken by the player will be enough that they would survive 2 levels like this but will be left on 1 hp for the 3rd level and will inevitably die.
Preserving HP (via using man)	Unless you are not the correct colour for a level, employing this strategy is strictly negative as you are using mana to change in a way that would cause you to take damage, however if you do not match the colour this strategy is extremely beneficial as it ensures you do not take damage for the level.	In this case using mana here as it will be a waste and the user will simply be punished for their wastefulness.	Here I see a point to doing it but only if the player knows a mana pellet is around.
Speeding through level to reduce damage	Speed through the level with a single colour will take a lot of skill to avoid taking too much damage to reach the end of the level. It is extremely difficult and challenging to complete but it is possible and you will be left with 1 hp by the end of the game.	Your skill level will be everything in these stages and you can do these stages with 0 damage if you are good enough regardless of colour.	In these levels you will still take a bit of damage but you can complete with no issue if you are speedy enough.

Utility Worksheet and Checklist

Utility

Your game is likely to associate a value with each outcome of the random event. If not then consider if the random event even affects the game at all.

Write down the value of each outcome.

Outcome:	**Value:**
Hp lost over time due to standing on wrong colored block	*100 is total Hp and 1 hp is lost every 0.25 seconds*
Mana lost per color change	2 mana give and 1 consumed per change
Hp gained at the end of a level	You restore 10 hp at the end of a level

Calculate the expected utility resulting from the choice of probabilities that you have used. Comment on the consequences for your game design.

*Utility wise because there is no probability, it will depend on user skill to get trough levels but the way the equations play out in this case is that one is only allowed to be on a block that is disadvantageous for 100*0.25 seconds in total before they are killed. This means the use is only allowing 25 seconds of time in total if hp was the only value one needed to account for in terms of utility. While every level has a total of 6 blocks on average it means to survive one level a player only gets about 4 seconds of time per disadvantageous block to survive but this needs to be accounted for multiple levels, so the user needs to think about how they can distribute damage. You heal about 10 hp at the end of a level which translates to about 2.5 seconds worth of time gained in terms of usage.*

Mana is a fixed value which allows you to change between different forms at will and you get it fully replenished every 5 levels. If 2 mana is replenished every 5 levels that means that the intended amount of mana used on average per level is 0.4 mana.

*Both of these come together because mana makes the hp loss on a level close to 5 hp by changing to the correct colour, while levels where there is an harmful colour will have an hp loss of nearly 30 if played badly. This is an insane contrast between both forms and the way it plays out in game design terms would be that there will be bad trades but every 5 levels you get a chance to breathe and replenish before you need to get into it again. Considering there are 2 levels where you will lose 5 hp if you play well while there are 3 levels where you lose 30 hp for playing badly in the game. In total the 100hp makes sense to give to a player as 30*3 = 90 and 5*2 = 10 so 90+10 =100.*