

SHUTTERBUG

Game Design Document



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Contents

Project Overview - Shutterbug	4
One-line Summary	4
Description	4
Target Market	4
Competitor Analysis	6
Competitor 1 – TOEM (A Photo Adventure)	6
Competitor 2 – Viewfinder	6
Competitor 3 – Umurangi generation	7
Design Pillars	7
Synopsis of Gameplay	8
Game Mode – Contract work (Singleplayer)	8
Description	8
Objectives / Goals	8
Game Loops	9
Game Mechanics	11
Mechanics List	11
Photography	12
Interactable props	16
AI	17
Traversal	19
Rules & Systems	20
Magical moments	20
Scoring	22
Game Economy	26
Economy overview	26
Economy List	26
Economy - Time	26
Economy - Film	27
Narrative overview	28
Premise	28
Design principles	28
User Interface & Controls	29

UI LIST:	29
User Interface Design.....	30
Main Menu Screen.....	30
End level Screen.....	32
Player HUD.....	33
In camera POV.....	36
Level Select.....	37
Level Brief.....	37
Settings Menu.....	39
Pause Menu.....	40
Credits screen.....	41
Feedback Systems.....	42
Controls.....	43
Keyboard & Mouse.....	43
Xbox Controller:.....	45
UI Mock-ups – Multiple platforms.....	47
PC.....	47
Xbox Console.....	47
Game Content.....	48
Content Types.....	48
Interactable props.....	48
Ai-interactable objects.....	49

Project Overview - Shutterbug

One-line Summary

First-person puzzle game that involves the player taking photos of other people's special moments in busy events.

Description

Shutterbug takes place in a venue with multiple events hosted in it which function as distinct levels and the player is challenged to take photos of special moments that happen throughout the duration of that event.

During the event, the player will have to keep an eye out for when something is happening and prepare the shot accordingly by interacting with props in the scene and adjusting camera settings to compose a good photo.

Target Market

Target market: beginner photographers

Traits:

- Is not familiar with instant film cameras
- Wants to feel like a professional photographer without the experience yet
- Teenager to young adult (10-25 yrs old)
- Casual gamer

Design considerations:

- Simplified camera controls
- Let controls be easily learned through experimentations (self-explanatory controls, following a player's suggestion of what a typical camera would look and act like)
- Feedback must be visually and auditorily appealing
- Environment should match realistic photography with instant film cameras to promote learning

Persona – Target market of Shutterbug

Name: Kyle Cooper



Bio: Kyle cooper is a 20-year-old university student majoring in a Liberal Arts degree. Other than his studies, he spends most of his time casually playing video games and hanging out with friends.

He was interested in taking some photos for him and his friends on a road trip, but his experience in photos comes from mobile phone photography and game screenshots. He wants to replicate those impressive photos by getting an instant analogue camera but quickly loses interest when the process feels too technical. He wishes that there is a way to learn how to get good shots in a fun way.

Gender: Male

Age: 20

Income: (AUD)\$65,000

Motivations:

- Loves feeling like a professional photographer
- Loves taking pictures that look visually appealing
- Enjoys experimenting for better photos

Needs:

- Easily accessible game
- Instant and mesmerising feedback
- Simple to understand tutorial and mechanics
- Welcoming difficulty curve for casuals

Frustrations:

- Hobbies with high barrier of entry
- Too many mechanics to manage
- Overly punishing gameplay
- Unclear action feedback

Behaviours:

- Only plays games for a short period of time
- Likes to experiment to see what happens before reading instructions
- A casual player that loves to share their photos with others

"I want to feel like a professional photographer, but I feel like there is a huge barrier of entry to be able to take a good photo."

Competitor Analysis

Competitor 1 – TOEM (A Photo Adventure)

Description

A photography game where the player helps NPCs by solving puzzles using the player's camera.

Key Strengths

- Intuitive gameplay loop
- Simple camera controls
- Unique mechanics

Positioning

- Serves to fill the need for casual photography games which are still scarce

Competitor 2 – Viewfinder

Description

A puzzle game that makes the player use an instant camera to take photos that can change and shape the environment.

Key Strengths

- Intuitive and simple gameplay
- Easy to understand art direction

Positioning

- Fills the niche for Puzzle-solving genres in line with games such as Portal and Superliminal.

Competitor 3 – Umurangi generation

Description

A photography & puzzle game where the player needs to take photos of objects or events and is then expected to adjust them like they are using a dslr camera

Key Strengths

- Allows / encourages creative photos
- Strong environmental storytelling
- Multifaceted scoring (colour/content/composition which dynamically adjust)

Positioning

- A puzzle solving game that allows player creativity & freedom of expression.
- Political game talking about social issues

Design Pillars

- **Capturing magical moments** – Gameplay revolves around capturing spontaneous moments for people to remember
- **Organizing in chaos** – Enable understanding and recognizing things happening in a busy scene

Gameplay Design

Synopsis of Gameplay

One level takes 4 mins to complete, with magical moments happening every ~60 seconds. The player must recognise when these moments are about to happen and set up the environment to take the perfect photo. Players that recognise something happening earlier get more setup time and a better shot as a result.

The player will know ahead of time what magical moments are expected to be captured (but not the order in which they happen), and an additional spontaneous moment will occur randomly throughout the level.

Game Mode – Contract work (Singleplayer)

Description

Player is scored based on how well the photos they take are composed and how much preparation they were able to do before capturing the moment. The player will play through a level with events happening around the same time and an extra spontaneous moment which happens at a random time (when other events are not happening).



Objectives / Goals

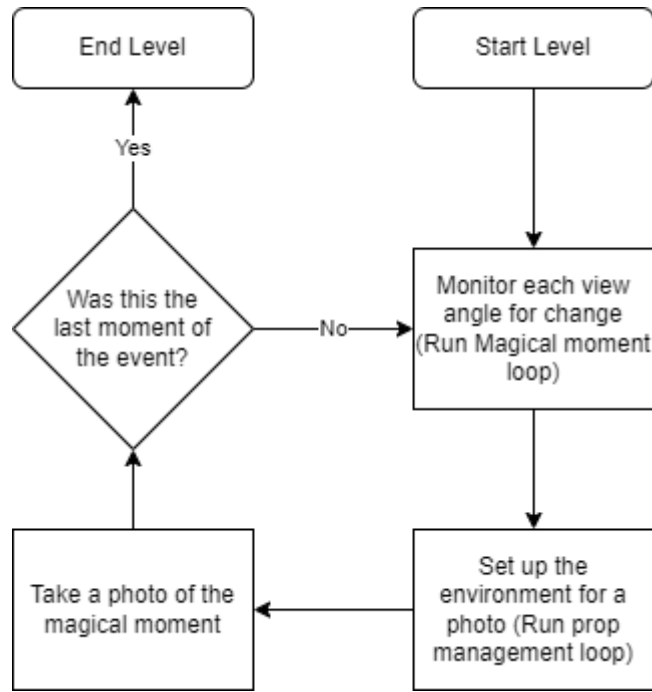
Set up the photo environment

Once the player identifies a magical moment happening, they need to

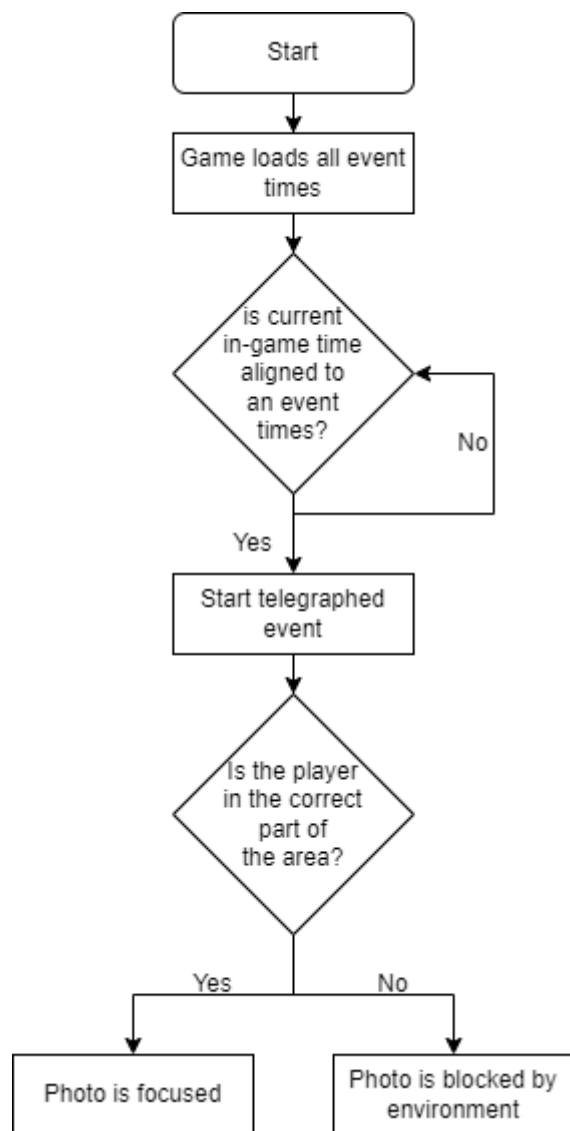
- **Take photos of magical moments**
the player has to take a well composed photo of the moment when it happens to be able to score.

Game Loops

Core Gameplay Loop



Magical Moment Loop



Game Mechanics

Mechanics List

- [Photography](#)
 - [Taking photo](#)
 - [Shutter speed](#)
 - [Focus](#)
 - [Flash](#)
 - [Blur](#)
 - [Film](#)
 - [Cooldown between photos](#)
- [Interactions](#)
 - [props](#)
- [AI](#)
 - [Telegraphed events](#)
 - [NPC Wandering/idling](#)
 - [NPC resetting props](#)
- [Traversal](#)
 - [Point & Click Movement \(spline movement\)](#)

Photography

Photography – Taking photo

Summary: The player can use a camera to take a photo of whatever the player is looking at.

Details:

- Player cannot move when using the camera.
- The camera can rotate and look around.

Related mechanics & systems:

- Focus
- Shutter speed
- Flash
- Blur
- Film
- Cooldown between photos

~~Photography – Shutter speed (STRETCH GOAL)~~

~~**Summary:** Player can adjust the shutter speed of a camera to change how exposed the scene is~~

~~**Details:**~~

- ~~• Would adjust the brightness of an image through leaving less time for light to hit the simulated receptors.~~
- ~~• Ue5 provides adjustable shutter speed already for cameras, allow players to change that within a range.~~
- ~~• If implemented, will have to redo brightness scoring to take the lighting of the captured scene into account.~~

~~**Related mechanics & systems:**~~

- ~~• Photography – Taking a photo.~~
- ~~• Scoring~~

Photography - Focus

Summary: Depending on what focus level the camera is using, targets at different distances from the camera may appear to be blurry or in focus.

Details:

- Changed in increments
 - Near / medium / far
- Camera's focus level affects the score of that photo.
- Can help to bring targets into focus at different ranges.
- Multiple subjects can be in focus at the same time if they are on the same focal plane.

Related mechanics & systems:

- Taking photos
- Blur

Photography - Flash

Summary: When the camera takes a photo, a flash of light will be emitted at the front of the camera that lights up the area directly in front of the camera.

Details:

- Helps lighten up what would be dark photos.
- If the scene is already bright, the flash from the camera could make the photo too bright and make it hard to make out what is in the photo.

Related mechanics & systems:

- Blur
- Taking photos

Photography - Blur

Summary: If the conditions in a scene are compromised by being too light, too dark, or if the player is using the wrong zoom level from where the player is and the target subject is, the photo will come out grainy, overexposed, or blurry.

Details:

- How blurry a photo is will affect the photo's score.
- Conditions of the scene impact the blurriness of the photo after the film develops.

Related mechanics & systems:

- Film
- Taking photos
- Flash
- Zoom

Photography – Film

Summary: Whenever a photo is taken, the player will use film, and the amount of film is limited.

Details:

- Film is used every time the player takes a photo.
- The amount of film the player starts with at the start of a level is static.

Related mechanics & systems:

- Taking photos
- Blur
- Cooldown between photos

Photography – Cooldown between photos

Summary: There is a brief period in between photos where the player cannot take photos again to let the film develop from the photo that was just taken.

Details:

- The camera will not be able to take photos straight after taking one and the player will have to wait before taking another photo.
- Could impact the players ability to recover from a bad photo of an event.

Related mechanics & systems:

- Taking photos
- Film

Interactable props

Interaction - Props

Summary: The player can interact with props around them by clicking the prop or pressing the associated button.

Details:

- Pressing the button will change the props state.
- The props can have multiple states with only one that scores properly.
 - E.g. a set of blinds that can be opened different amounts (cycling each interaction) to let a different amount of light through.
- Props are only interactable from one specific spot the player can stand, cannot interact from far away.
- Props require time to interact with, during which the player cannot interact with other props. (e.g. a light switch takes 0.25 seconds to flick during which the player cannot interact with anything)

Related mechanics & systems:

- Photography scoring
- NPC resetting props.
- Player traversal

AI

AI - NPC Wandering/idling

Summary: When an NPC is not taking part in a magical moment, they should look like they're participating in the event still.

Details:

- NPCs should play various animations, so they are interacting with each other or objects around them.
- NPCs should move between a few animations to prevent repetition.
- NPCs can transition to other animations if they must participate in a telegraphed event or must reset an interactable prop.
- When a major moment is happening in the level (like marriage vows) NPCs should all do a certain action (e.g. sit down)
- ~~STRETCH GOAL~~ Create objects for the NPCs to interact with throughout the map (e.g. a water cooler they can stand around)

Related mechanics & systems:

- Telegraphed events
- NPC resetting props.

AI - Telegraphed events

Summary: NPCs should have clear indication when they are about to do something for a magical moment.

Details:

- Specific NPCs will have a component that allows them to respond to magical moments happening (e.g. a birthday kid, or the wife at a wedding)
- Leading up to the magical moment the NPC stops whatever it was doing and plays a distinct animation so the player can understand what is happening.
- One NPC can be involved in multiple different moments in a level.

Related mechanics & systems:

- NPC wandering/idling

AI – NPC resetting props

Summary: NPCs should reset some props the players interact with after a short amount of time.

Details:

- Interactable props will be spawned with an NPC dedicated to resetting them.
- After the player has interacted with a prop, a timer will begin counting down. Once enough time has passed the NPC will set the object back to its original state.
- E.g. After opening the blinds for better lighting, an NPC gets too hot and closes the blinds again.

Related mechanics & systems:

- Interactable props
- NPC wandering

Traversal

Traversal – Point & Click Movement

Summary: The player can travel between three fixed points by clicking on a specific path (It will show an arrow to indicate that the player can move towards it).

Details:

- An interactable arrow will be placed towards each location the player can travel to.
- If the player clicks while the arrow icon is up, the player will then perform a movement transition which lets the player travel along a predetermined spline pathway.
- Moving around takes time during which the player is stuck visually traversing between areas.

Related mechanics & systems:

- Interactable objects

Rules & Systems

- [Magic moments](#)
 - [photo opportunities](#)
 - [spontaneous moment](#)
- [Scoring](#)
 - [Scoring](#)
 - [End screen](#)

Magical moments

Magical moments – Photo opportunities

Summary: A moment where the player can score by taking a photo to remember a memorable part of the event.

Details:

- Telegraphing before moment happens
- Players will be told beforehand what events they are looking for
- There will be 5 telegraphed events that will happen in the level
- 1 major event, 3 minor events, and 1 randomized (spontaneous) event will happen in the duration of a level.
- The moment should only be visible (or in proper focus) from 1 position the player can stand
- Each event is spaced out mostly evenly in the level
 - Slight randomization in timing, e.g. +/-10 seconds from the initial time
- When a magical moment occurs, the player regains one film

Related mechanics & systems:

- AI – Telegraphed events
- Photography - Film
- Photography – Taking photo
- Traversal – Changing camera angle points
- Magical moments – Spontaneous event
- Scoring - Scoring

Magical moments — Spontaneous event cut due to time

Summary: A special variant of a magical moment which happens much more suddenly and is not initially told to the player.

Details:

- ~~This event will happen randomly during the whole duration of the level.~~
- ~~The player does not know this event before it happens.~~
- ~~Can happen at almost any point within the level.~~
 - ~~Cannot happen too close to the start of the level.~~
 - ~~Also, cannot happen during a different photo opportunity.~~

Related mechanics & systems:

- ~~Magical moments — photo opportunities~~

Scoring

Scoring - Scoring

Summary: Once a photo has been taken, scoring evaluates the quality of the shot.

Details:

- After an individual magical moment were taken, a score will be given – which will then be stored in the scoring system.
- There will be two types of scores – individual scores on each moment, and the overall combined score of all moments in a level.
- The score can then be used at the end screen to judge the player’s overall score/rank.
- Score will be based off these criteria
 - Correct timing
 - Multiplier/bonus if taken at a certain time during the moment
 - ~~Right framing~~
 - ~~Evaluate objects based off the rule of thirds, give multiplier/bonus for being along a line on the screen (stretch goal)~~
 - Setup
 - For each interactable object in the photo, gain/lose points if it’s in the correct state
 - Lighting
 - Included in setup scoring – designers should focus on making the player solve lighting through interacting with objects
 - Blur
 - If the image is too far away or too close (out of focus), give a penalty to scoring

Scoring Considerations:

- Isolate subjects / space out subjects
 - Ideally break photo into areas, and if an area is too dense then penalize objects in there
 - Implementation plan: multiply subjects by their size compared to the whole section ? (so tiny subjects contribute less score and bigger subjects contribute more score)
 - ~~Maybe break up scene using weighted Voronoi based on point value of objects?~~
 - ~~Alternatively break up scene using rule of thirds~~
- leading lines
 - if empty or filled space forms a line your eyes can follow, reward player for that
 - implementation ???

- symmetry
 - similar pattern appearing along some axis of symmetry should lead to a better photo overall
 - implementation: maybe take the areas of the photo and check if similar areas of the photo have stuff in them & multiply by similarity ??

Scoring formula:

$$totalScore = \left(\sum_{i=1}^n f(i) \right) + symmetryMult + leadingLinesMult$$

$$f(i) = baseScore_i \times \max((1 + lighting_i - blurFactor_i + timingValue_i), 0) \times sizeInFrame_i$$

Timing value determined by the point in a magical moment (e.g. mult will be higher when something interesting is happening and lower when the moment just passed)

Base Score is the score of an actor or object (in its current state)

lighting is a value between 0 and 1 based on if the object was lit correctly

Blur factor is determined by how far away the object is from the focal plane of the camera (and the depth of field value so wider lenses have more effective range)

Blur factor is determined by $\left(\frac{hitDistance - FocalPlaneDistance}{maxRange} \right)^2$ where **maxRange** is the point at which an object is considered fully out of focus (determined by $FocalPlaneDistance \times \left(1 - \frac{1}{Aperture} \right)$), the focal plane distance is how far away the focal plane has been set and the **hitDistance** is how far away the object is from the linetrace origin. The ^2 at the end creates an exponential curve to make the score drop off more gradual.

Possible engine viewmode that replaces need for a blur factor (show -> visualize -> depth of field layers)

Size In Frame is a multiplier based on how much of the image is taken up by the object (STRETCH GOAL)

Symmetry Mult is a multiplier if the photo follows some axis of symmetry (MEGA STRETCH GOAL)

LeadingLinesMult is a multiplier if the photo forms some sort of line the players eye would travel along (MEGA STRETCH GOAL)

Scoring inside the event:

During the event, the average magical moment will require 2500 points to be given a star rating. This generally requires 10-12 average-scoring objects and one or two high scoring objects in the scene.

Overall the event should have 10,000 points for all normal events and an extra 4000-5000 points for the spontaneous moment.

Related mechanics & systems:

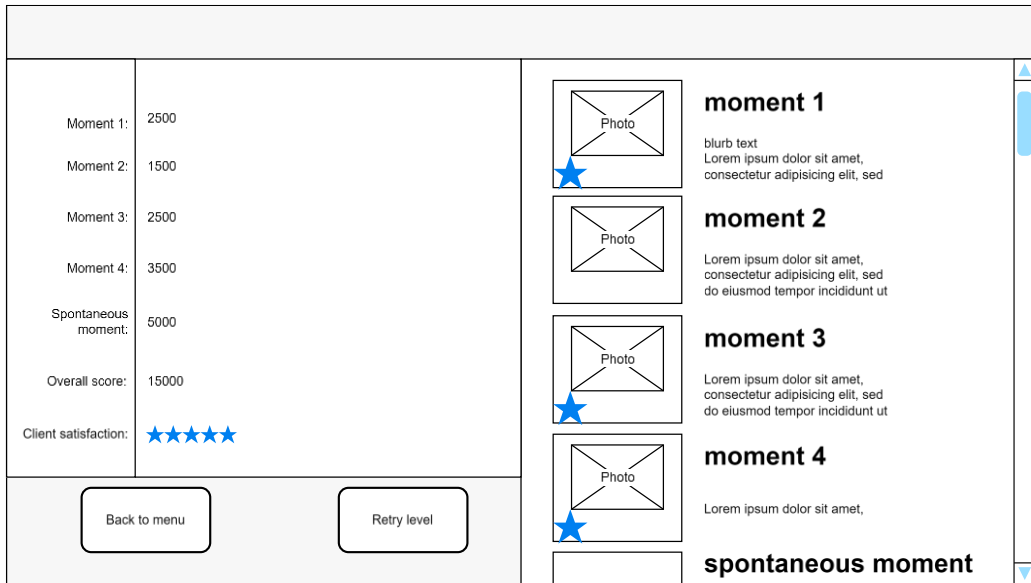
- Scoring – end screen
- Interactable props
- Magical moments
- Photography – taking a photo

Scoring – End screen

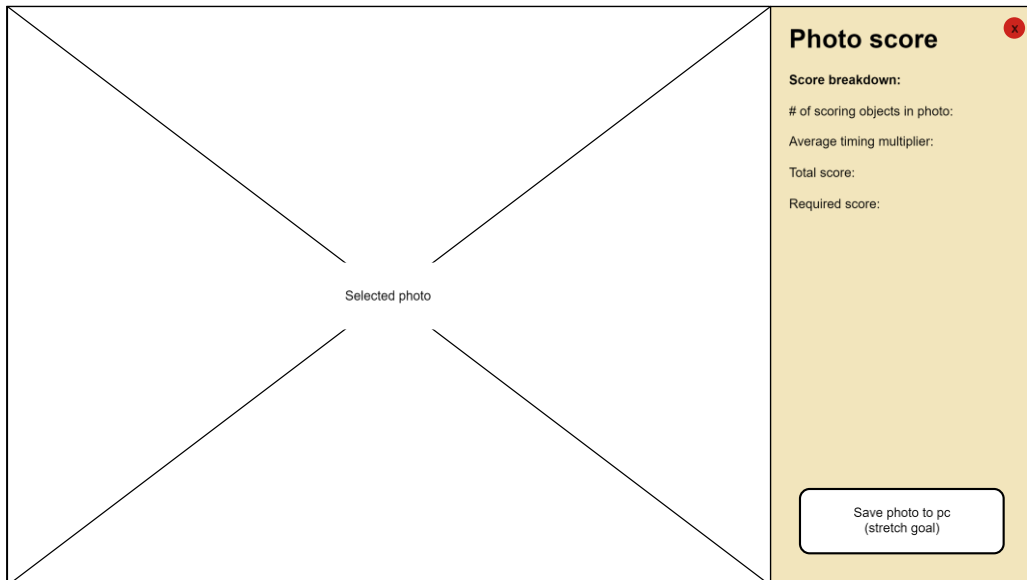
Summary: A menu that shows the player how successful they were at taking each shot, and an overall score/rank.

Details:

- Individual scoring of each magical moment (using the “best photo” if there was multiple)
- An overall score based on how successful the player was at taking each photo
- Should indicate if a player misses a photo opportunity (photo will be missing)



When clicking on a photo:



-
- End level wireframe
 - Can press on individual photos for score breakdown (will also show photo in full screen)

Related mechanics & systems:

- Scoring – scoring

Game Economy

Economy overview

The player will have to manage their film reserves and their time when playing through levels. Film gives the player the opportunity to capture moments multiple times if they made a mistake to score higher, and the players must manage how much time they spend in each area to be able to set up for the photos properly.

Economy List

- Time
- Film

Economy - Time

Economy overview:

The player will only have a certain amount of time within a level to take photos of events, and the events will be timed as well.

Details:

- The level will last long enough for all the events to play out without overlapping each other and will also give the player enough breathing time in between events to prepare for another
- Events will also be timed, so the player must find the right time to take a photo to get a good score
- The player's interactions (mainly with objects) are limited by time as well, meaning that the earlier the player recognizes something happening the more points the player can score
- Objects with multiple states should be proportionally faster to allow the player to access all states easily

Economy - Film

Economy overview:

The camera will come with limited film that the player will use to take photos of the events that happen throughout the levels

Details:

- Each photo taken with the camera will use up film
- The player will start with the same amount of film every time
- Depending on how much unused film the player has at the end of the level after taking photos of all the events, the players score will be increased

Narrative overview cut due to time

Premise

You are an event photographer who follows a family and captures moments special to them.

Design principles

Structure:

- Linear story, player learns about the family as they go through the game
- Story should help motivate players to care about the family & give reason for taking photos.

Storytelling format:

Story delivery:

- Player will get most information through the brief before a level and by the events they observe / capture during the level.

Storytelling techniques:

- Photos the player will take will have more information given about them in a gallery where the player can view previous photos they took (STRETCH GOAL)

User Interface & Controls

UI LIST:

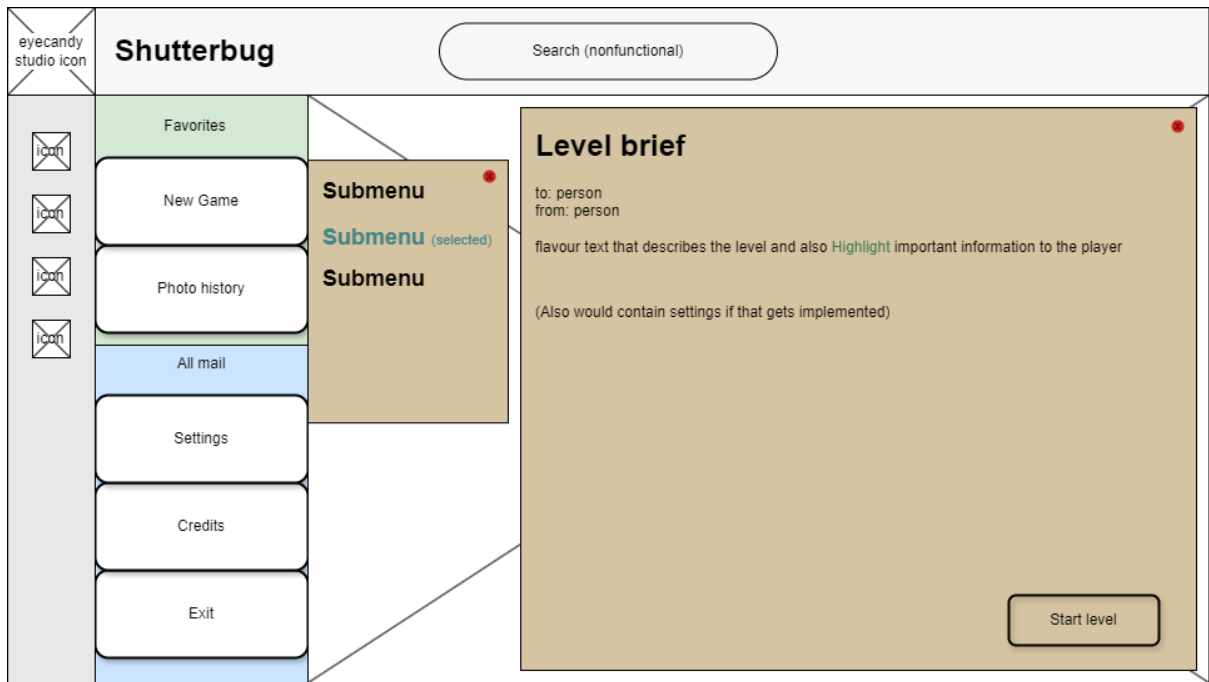
- [Main menu](#)
- [Level selection](#)
- [Level brief](#)
- [Settings Menu](#)
- [Pause menu](#)
- [Player HUD](#)
- [Camera HUD](#)
- [Level end screen](#)
- [Credits screen](#)

User Interface Design

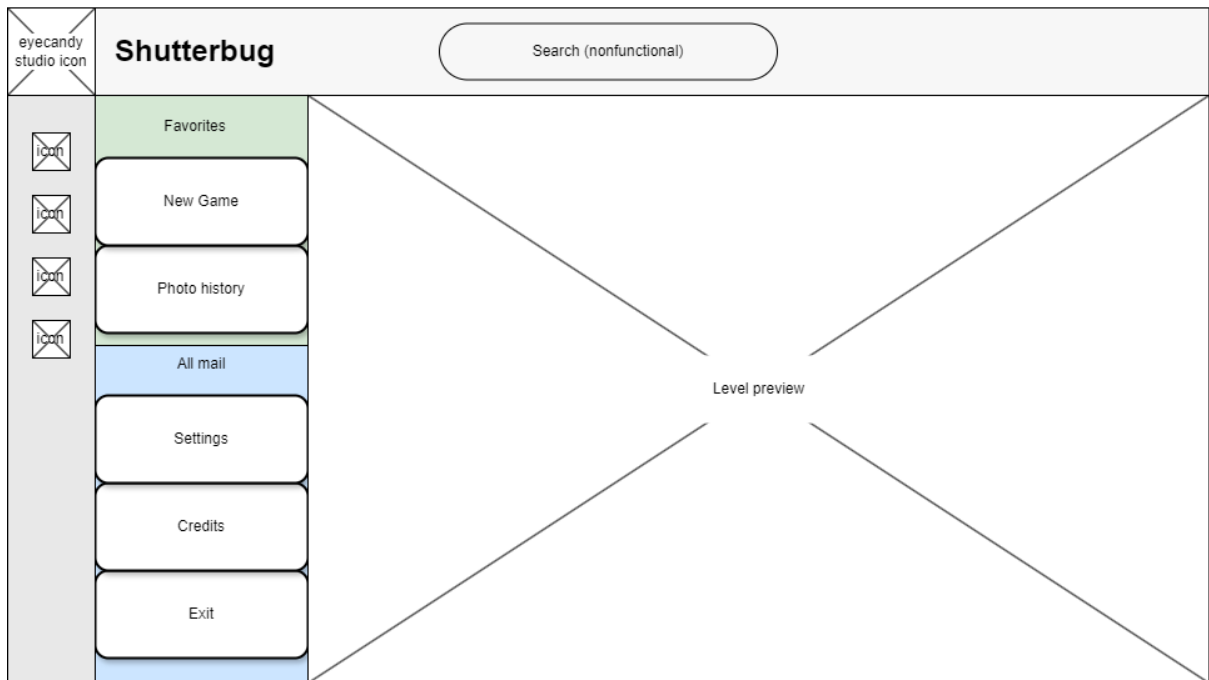
Main Menu Screen

This screen will greet the player when they boot-up the game or when returning to the main menu.





Without any menus open

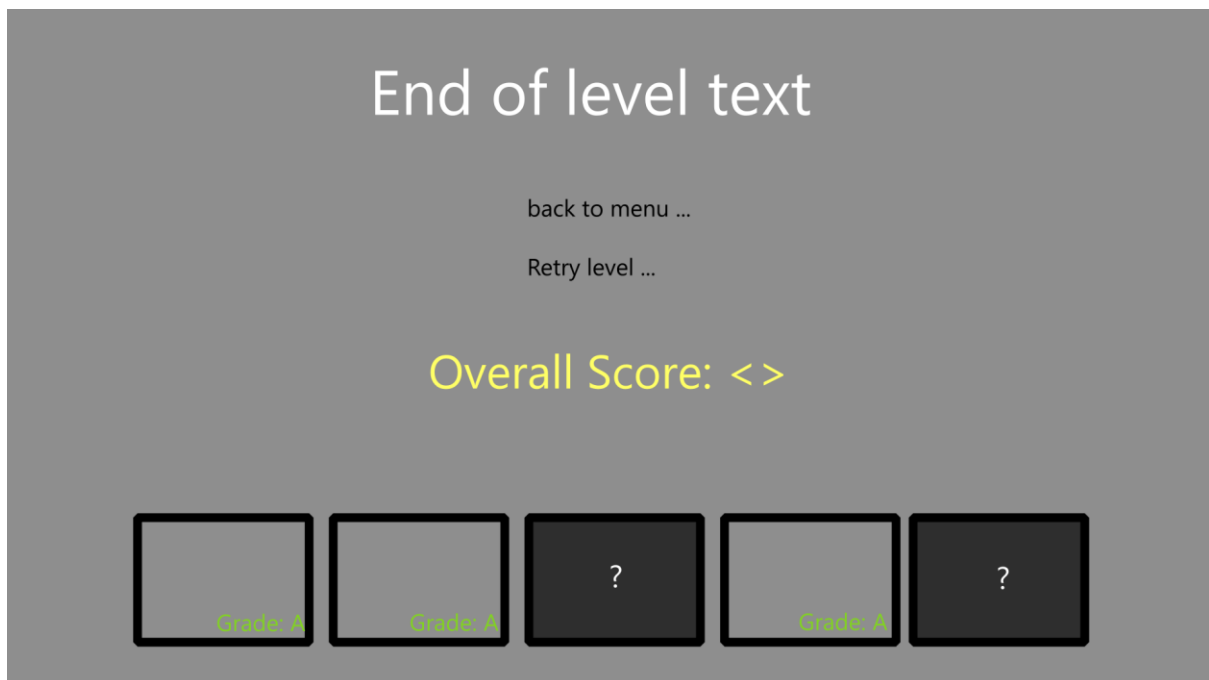


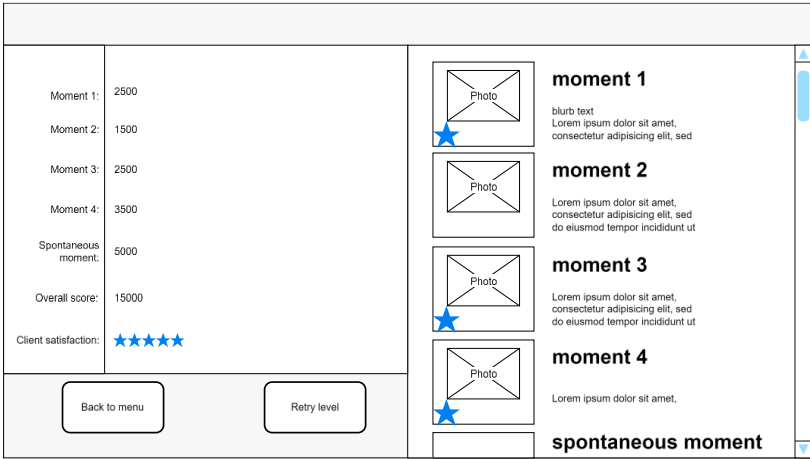
Main menu includes credits, settings and level select as submenus

Photo history is a stretch goal that includes photos the player has taken previously and their score on events.

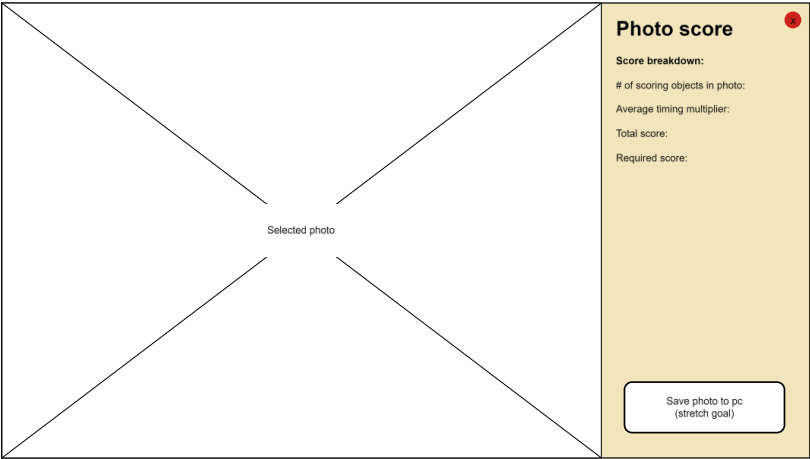
End level Screen

A screen once a level has been completed, shows players overall score alongside.





When clicking on a photo:



Player HUD

Shows remaining film, the objects the player can interact with (alongside a button to interact with them), the locations the player can go to and the time of day (so the player can know when the level is over / when something is happening like new year's).

Current time: (ingame time)

Key to toggle object state



Key to toggle object state



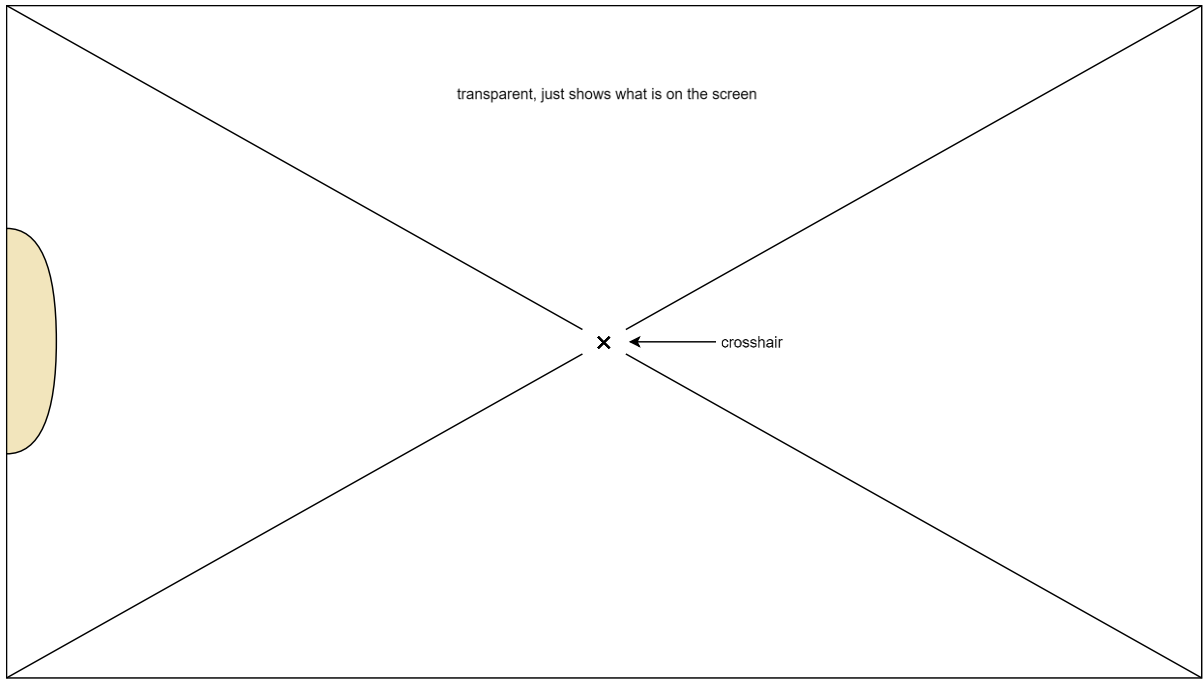
5 / 7 (Film remaining)



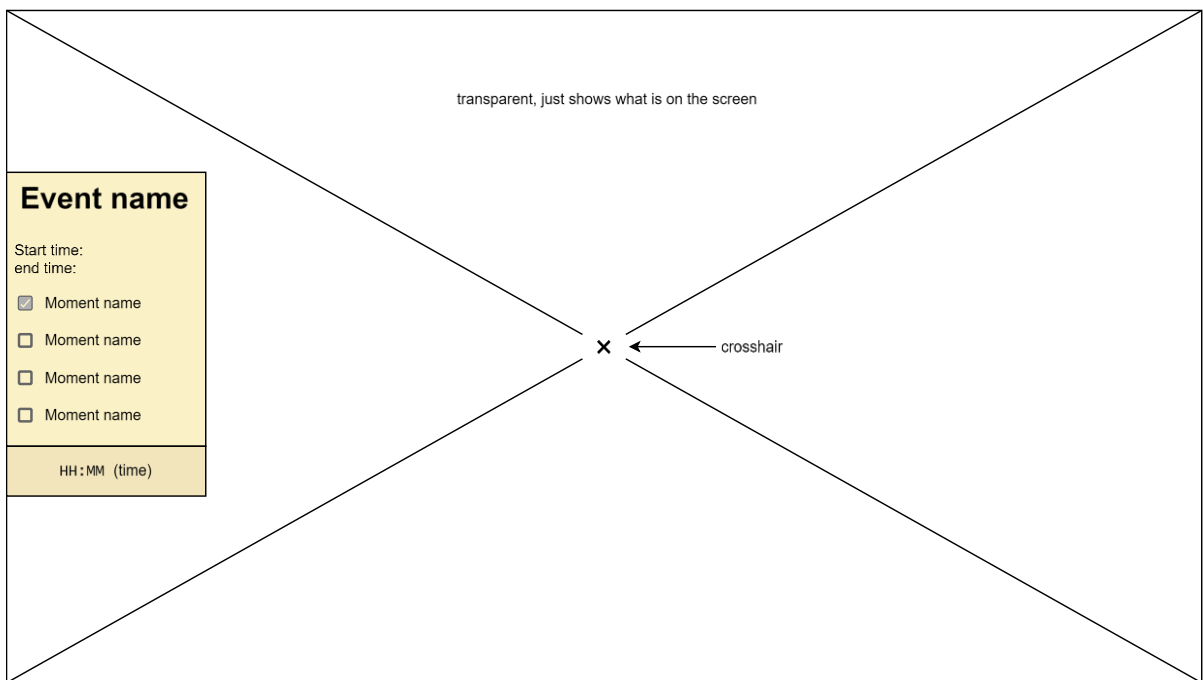
(Button to go left)



(Button to go forward)



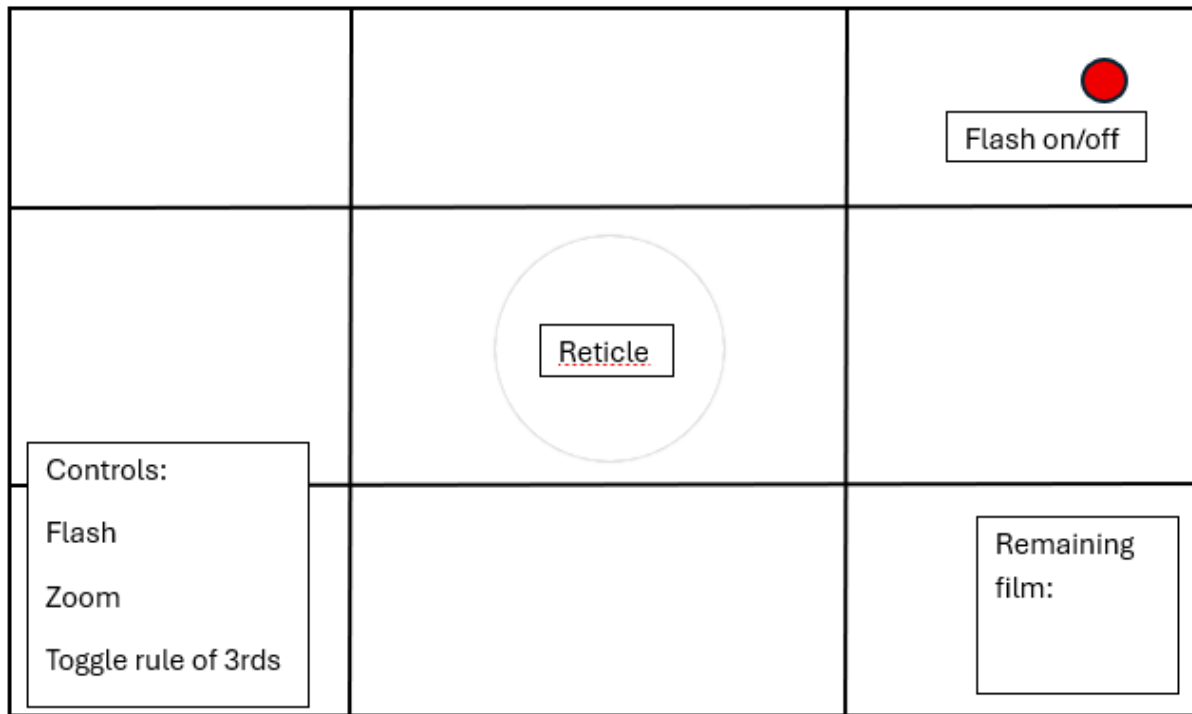
Menu uncollapsed

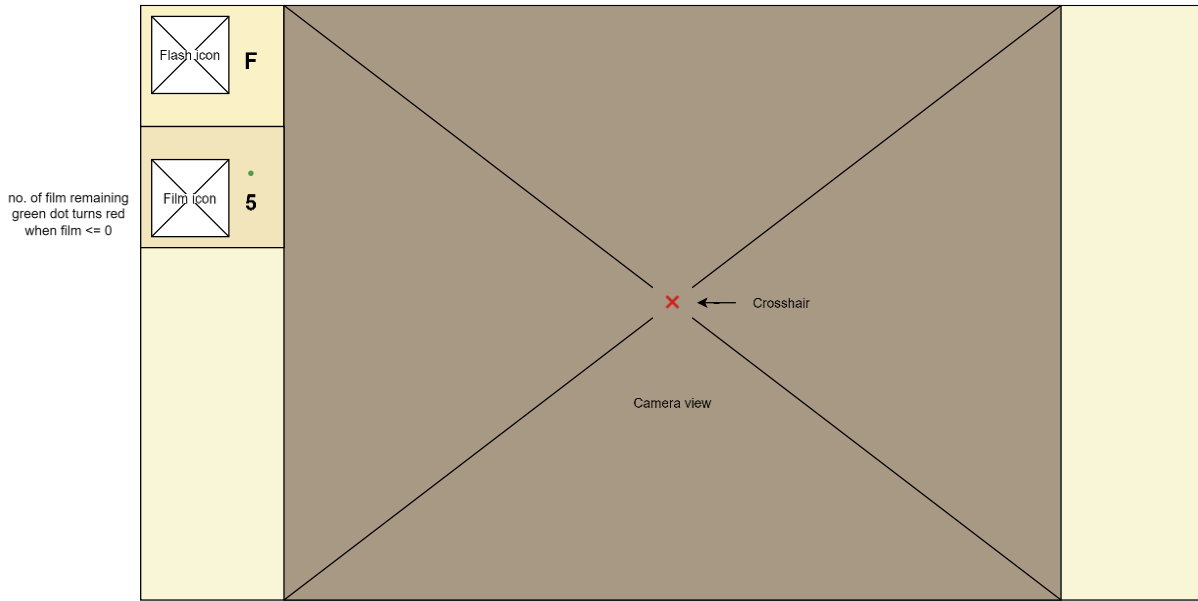


The main hud just has a menu on the side where it includes the information about the event, and a crosshair for the player. The side menu can be toggled with TAB

In camera POV

Simple controls and indicators that would be helpful for the player to know when in the camera.

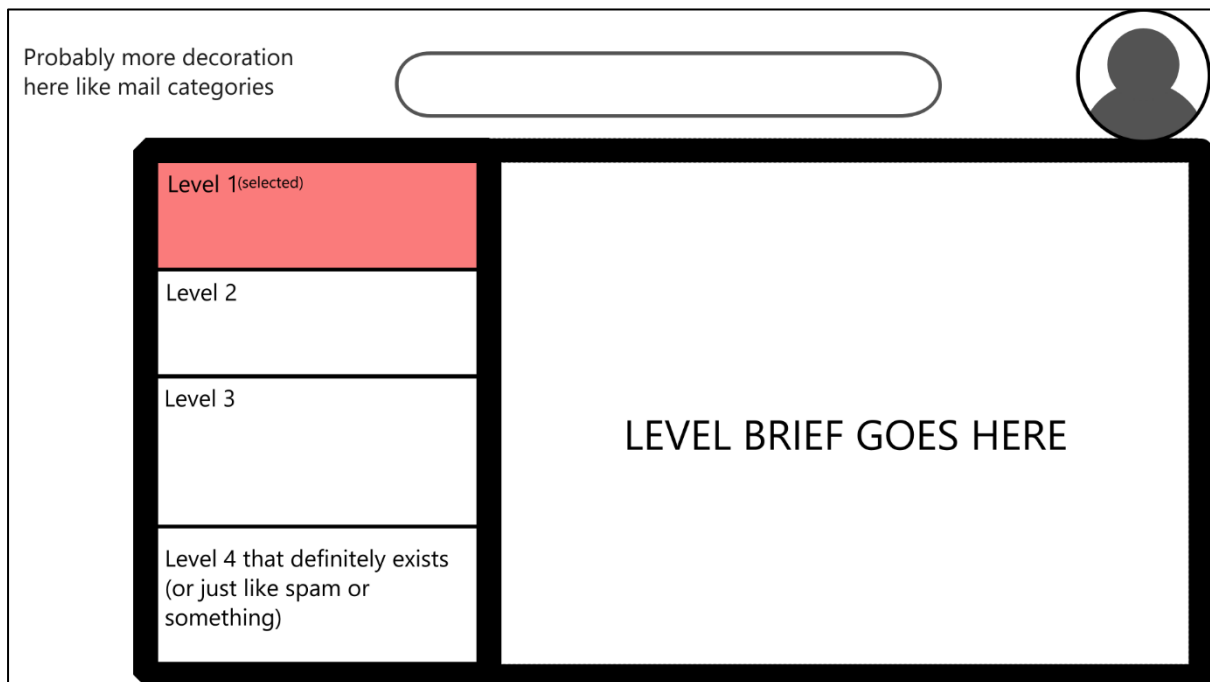




The camera hud has an indication of how much film the player has remaining, and if flash is on.

Level Select

Email messenger styled UI, can choose a level here.



Level Brief

When the player selects a level to play, they will be presented by a briefing message from the client at the venue describing their needs.

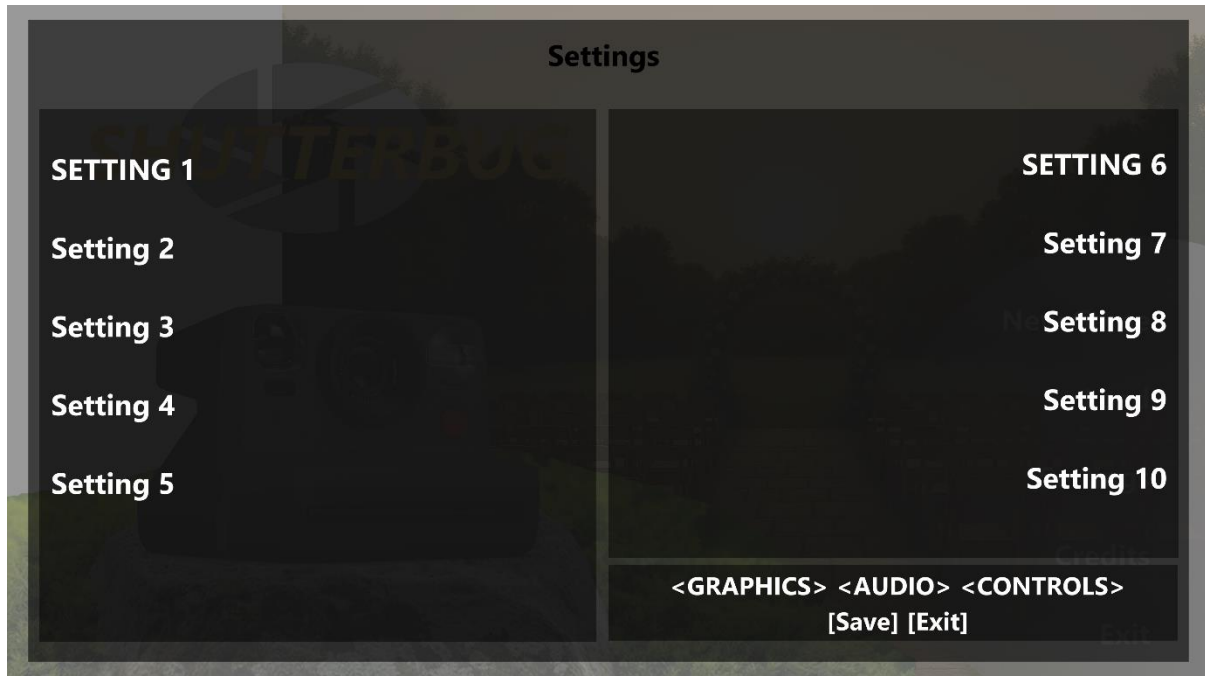
The briefing message will include information about:

- What kind of event is taking place
- How long the event is going on for (start/end time)
- The four “magical moments” the client is expecting you to take photos of

Settings Menu

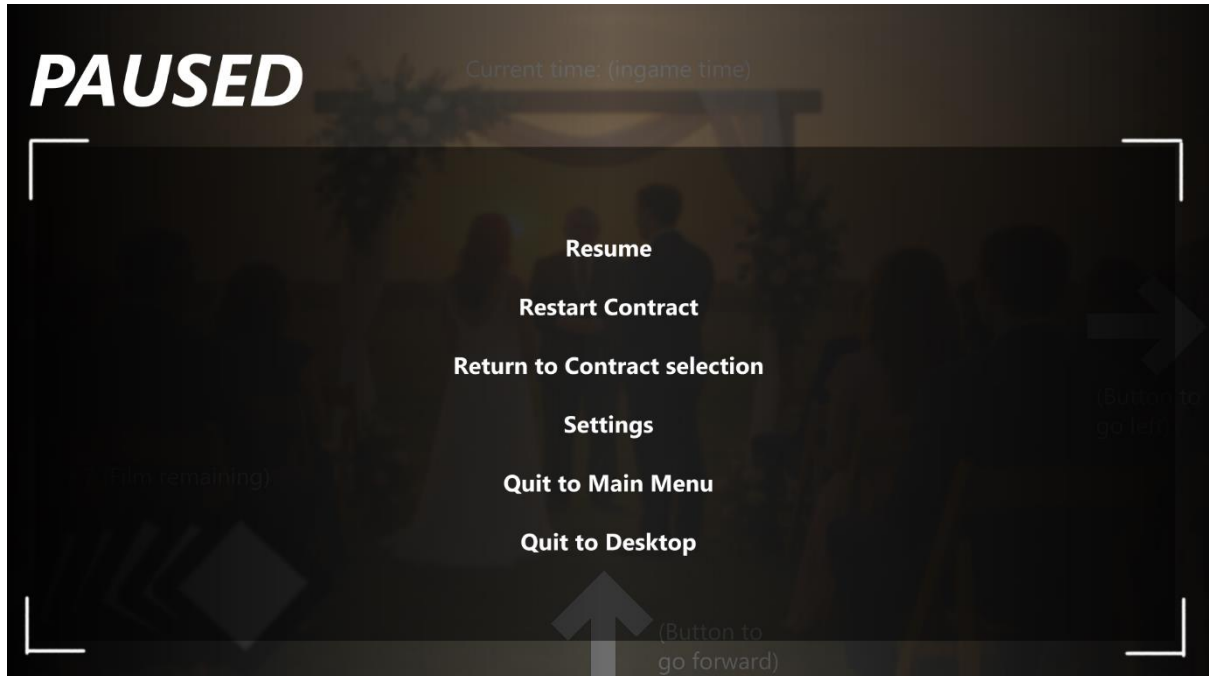
Three settings menus: one for graphics, one for audio, one for controller bindings

Each menu should contain sliders/input boxes that allow the player to customize values within a range alongside a description of the value they are modifying.



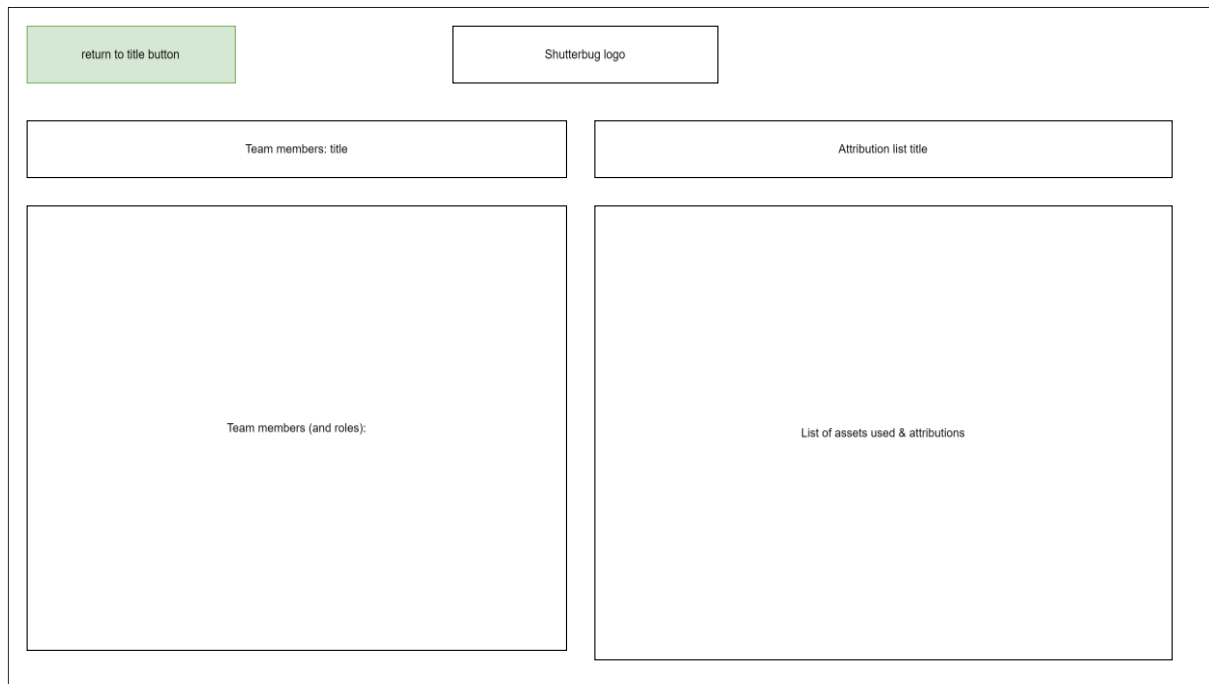
Pause Menu

The pause menu should halt ticking functions of the game and give the player a few options such as resuming the game, restarting the level, and returning to other menus like the main menu/settings menu.



Credits screen

Screen showing credits for group members and any licensed assets used.



Feedback Systems

Visual

- Outline of interactable props in the level & associated button to interact with them
- UI element for film remaining.
- Arrows to indicate to the player that they are able to move to somewhere else in the level.
- Time visible on screen to tell the player how much time they have got until the level finishes.
- Camera shutter on screen or a flash to indicate that a photo has been taken.
- UI changes when swapping between first-person and the camera mode.

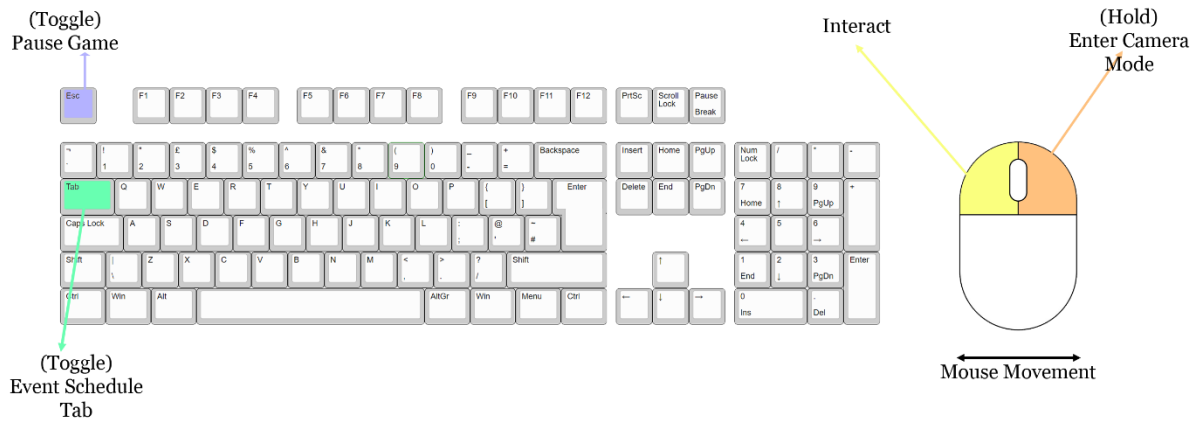
Audio

- Sound effects when changing the settings on the camera.
- Sound effect of a camera taking a photo when a photo is taken in game.
- Diegetic sound effects to indicate when a magic moment is going to happen.
- Interactable props will play sounds when they are moved.

Controls

Keyboard & Mouse

Normal Mode:



Look around – Mouse movement

(Hold) Enter camera mode – Right mouse click

Interact – E / Left Click

Travel – Left click on forward arrow on screen (Interact)

Collapse menu - Tab

(Toggle) Pause game – Esc

Camera mode:



Look around – Mouse movement

Take photo – Left mouse click

Toggle flash – F

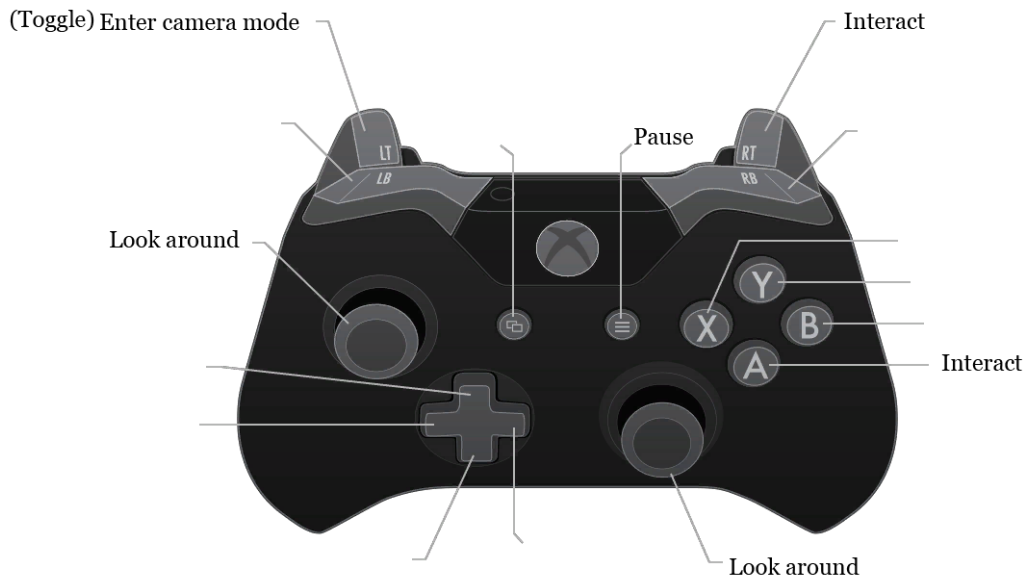
Cycle focal lens – Mouse scroll up / Mouse scroll down

(Release) Exit camera mode – Right mouse click

Pause game – Esc

~~Xbox Controller: (Not used)~~

~~Normal mode:~~



~~Look around — Right Joystick / Left Joystick~~

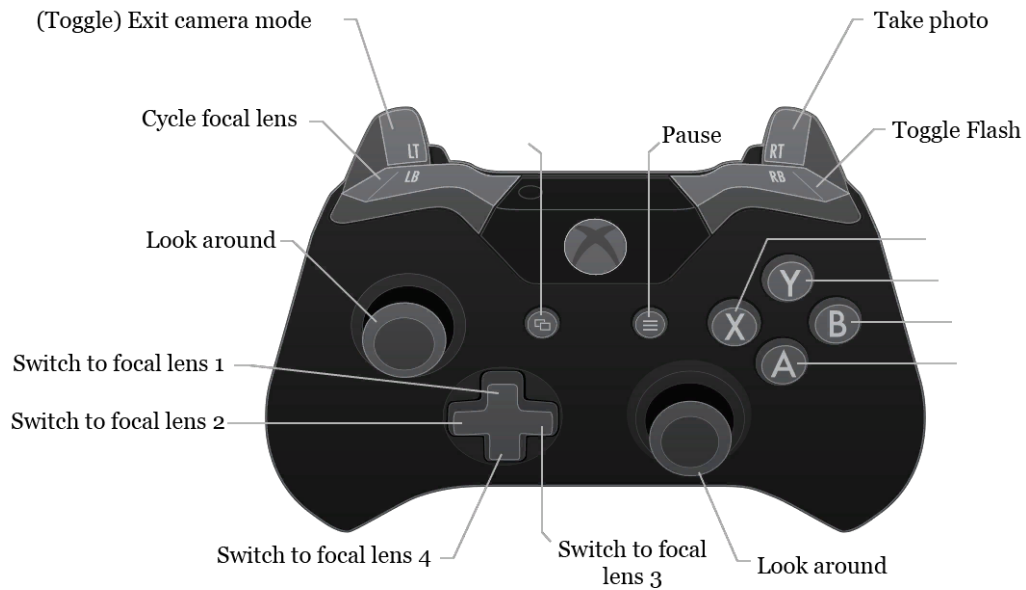
~~(Toggle) Enter camera mode — LT~~

~~Interact — A~~

~~Travel — Interact with arrow on screen~~

~~Pause game — Menu Button / Start~~

Camera mode:



~~Look around — Right Joystick / Left Joystick~~

~~Take photo — RT~~

~~Toggle flash — RB~~

~~Cycle focal lens (1-3 buttons) — LB~~

~~Switch to focal lens 1/2/3/4 — Directional Pad~~

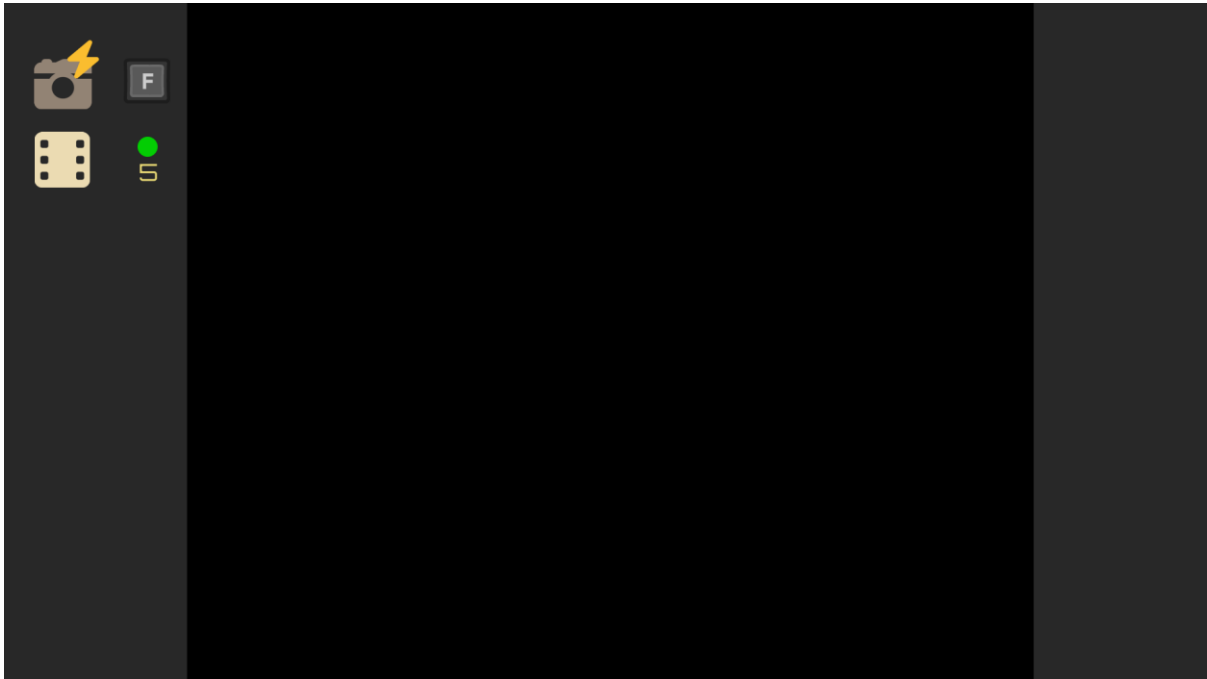
~~(Toggle) Exit camera mode — LT~~

~~Pause game — Menu Button / Start~~

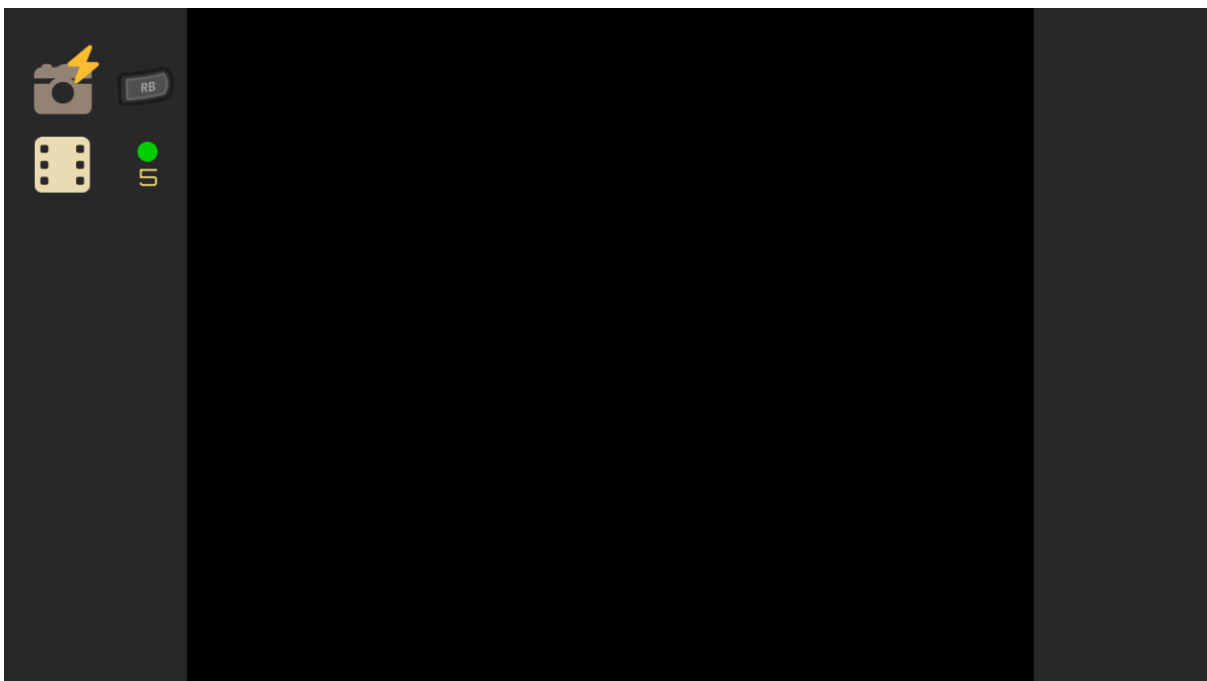
The pause menu should halt ticking functions of the game and give the player a few options such as resuming the game, restarting the level, and returning to other menus like the main menu/settings menu.

UI Mock-ups – Multiple platforms

PC



Xbox Console



Game Content

Content Types

- Interactable props
- Ai-interactable

Interactable props

- The player can interact with certain props around the level which impact the quality of the photo's composition.
- Interactable props when interacted with will rotate between multiple fixed states. Not all props have the same number of states to which they can move.
- When a player interacts with a prop it will not move instantly instead, it will move over a very brief period. During that period, nothing else in the level can be interacted with.
- Only props that are near the player can be interacted with and will only affect events in that area as well.
- AI will periodically interact with props around the level and change the states that props are in.
- When looking at an interactable prop, it will be outlined in the level for the player to better understand what they are looking at and what will be changing.

Curtains:

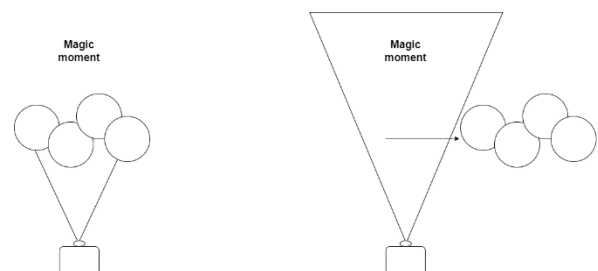
During first section of the level (before midnight) doesn't provide any light & makes photo darker, once fireworks begin going off then lighting outside becomes far brighter and allows tinted fog to appear.

Lamps:

Allow brighter / darker photos and gives player more fine control over what objects are lit up.

Balloons:

Blocks LOS to something until the player interacts with them, where they will be moved to the side



Rubbish piles:

Rubbish that accumulates as stuff from the party begins piling up in areas, the player needs to clear the rubbish when taking a photo otherwise they take a hit to their score. The player can avoid photographing the garbage altogether or can clean up the rubbish.

Rubbish piles will accumulate as npcs interact with them, causing a bigger mess.

Prop Name:	States	Interaction time	Score added
Curtains	Open, partially open, closed	0.5s	n/a
Lamps + switches	on, off	0s	n/a
Balloons Not implemented	Position 1, position 2	0.5s	+50, +50
Rubbish piles	None, small mess, medium mess, big mess	n/a, 0.25s, 0.7s, 1s	0, -100, -250, -500

Ai-interactable objects

- The ai around the level can interact with objects
- The purpose is to reset props players have interacted with and make the ai seem more realistic.

Prop Name:	effect
Rubbish piles	The ai will add to, or create a new rubbish pile. Upgrades the state of the rubbish pile by one (none -> small mess -> medium -> big mess)
Chairs	The ai can sit on chairs. While sitting on a chair the ai can: <ol style="list-style-type: none"> 1. talk if another ai is nearby 2. drink from the glass on the table or 3. get up again.
Glass	The ai can pick up the glasses on the table and attach/detach them from their own actor. Used when playing a drinking animation