TEAM FAST ROCKET
GAME DESIGN DOCUMENT

Interactive Media 313 – Intermediate Interactive Media Authoring

Team Fast Rocket is:

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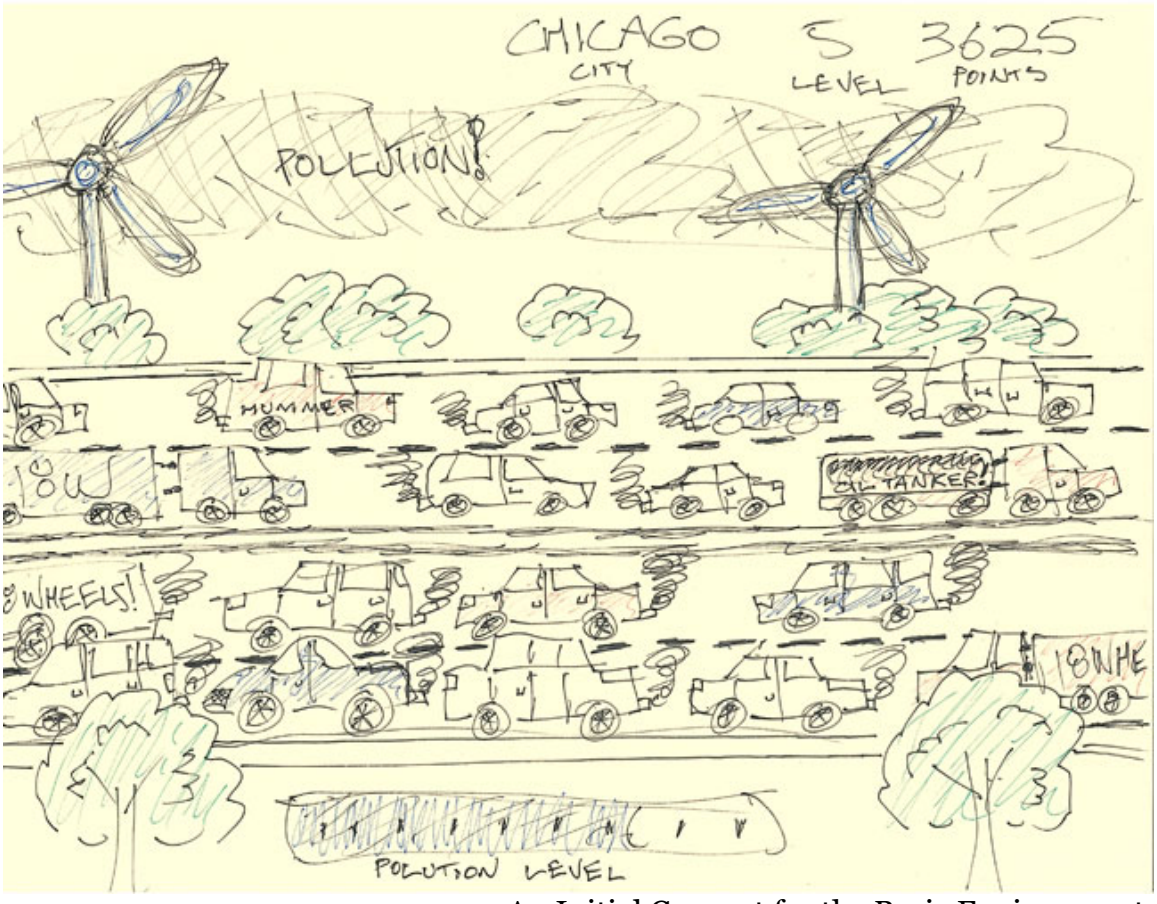
Table of Contents

The Defining Phase

The Idea:

Pollution is currently one of the world's biggest problems and you are the solution. You are high above the great cities of the world in a hot air balloon with the simple mission of cleaning their pollution problem. To do so, you use your magnet to remove vehicles that emit significant amounts of carbon dioxide or “gas-guzzlers”. Once you have successfully lowered the pollution in that city you get to move onto the next city that needs your services, but be careful, the longer the guzzlers are on the screen the more the pollution builds up. Let the pollution gather and soon enough you can't see your targets, ultimately failing your mission.



An Initial Concept for the Basic Environment:

The Three Levels of Design:

The design of the game will aim to immediately provoke a positive visceral response with attractive graphics and the simple but fun controls of the touch screen. Behaviorally it will be easy to pick up and play immediately, yet experience will definitely contribute to how far one will get in the game. With simple strokes of the finger, it will be relatively simple to understand. On the reflective level, one will learn while having fun. The user will be known as a global problem solver by their friends, the user will be satisfied of their accomplishments, and the user will forever remember just how good they felt that day. We may have exaggerated a bit, but you get the point.

The Educational Aspect:

While vehicles will not be named the same as real ones, but will resemble them. This can get a player aware about just how bad (or good) each style of vehicle is to the environment. The points and pollution meter will be relative to the damage these vehicles do in real life to really give the player a feel for how they are contributing to the problem in their daily life.

Platform and Development:

Our game will be developed in Flash for use on the Droid, utilizing its touch screen for an interface, and the desktop or laptop computers, utilizing the mouse for an interface. We hope that once issues with utilizing the Apple iPhone and iPod Touch are resolved our game will be ported for those devices as well. As for the dimensional aspect of the game, while the vehicles and other objects are two dimensional, they will be sized to perspective and layered appropriately to create a three dimensional environment. Thus, it could be considered a 2½-D game.

Controls:

The user can utilize either a touch screen or mouse, depending on the platform, to control the balloon.

When using the touch screen, the user touches the balloon, which will "engage" the magnet, dragging it will move the balloon, and releasing will drop the magnet. Touching the screen during the various menu screens confirms the selection.

When using the mouse, the user drags the mouse to move the balloon and clicking the mouse drops the magnet. Clicking the mouse also confirms any button selections and such from the menus.

The Overall Goal:

To create an educational game that not only teaches people about pollution, but is also fun to play.

User Profile:

Despite the overall premise of the game, the general audience it attracts will not necessarily be solely environmentalists. Anyone can pick up this game and have fun - the user is crushing cars with a giant electromagnet and hurling them into recycling bins like basketballs. As mentioned in the use case below, this can be an educational experience for users, showing how pollution emitted from vehicles has negative effects on the environment and how it can be satisfying to help the environment. It teaches them which vehicles are more harmful to the environment than others, encouraging them in the future to think more consciously about what vehicle they will drive. It may also actually encourage them to begin recycling in every day life. Like most flash games, this game is also ideal for anyone who has time to kill - it's available online, one can access the game from anywhere that has an Internet connection, and download it to their Droid phone and play via the touch screen. Also, with the option to download to ones computer and play with keyboard and mouse, the game isn't limited to those who have Droids. Just a keyboard or touch screen is all that is required to play and the game requires little technological skill and is easy to pick up and play. With only one button and two motions to execute during gameplay, the game's instructions will quickly get a new user fighting pollution immediately. Little technological demand means that all ages can play and with the growing consciousness of environmentalism, all ages would surely be interested in the competition.

Use Case Scenario:

Lately, I was growing sick and tired of all of these random pointless games teaching my kid more about robbing and mugging people then trying to help anyone. When I heard about the issues that this game was addressing like helping get rid of pollution I had to give it a try. My seven-year-old son and I sat down one afternoon and quickly got everything set up and ready to play. Immediately, I was very pleased with the message of the game, as a parent I want my child growing up knowing how he can help his planet and make it a better place to live for all of us. As my son clicked instructions, I was also pleased as to how the screen informed us that, by using our own fingers (or mouse), we could remove polluting cars and recycle them to help save the city. Then cars began to drive across the screen letting off a lot of dark clouds of pollution. I liked that the controls of the droid touch screen (even the traditional mouse), they were so intuitive and satisfying. My son seemed to really enjoy slamming his fingers down on the screen to grab the cars and swing them away with a flick of his wrist into the recycling plant. It made him feel like a god, and this brought a smile to my face. I'm glad he can enjoy a game that promotes helping the environment. We soon noticed that some of the bigger cars such as vans and trucks would let out bigger and darker clouds of pollution that would block our view of the road. They also gave

us more points for recycling. So I told my son we should try to grab the bigger vehicles if we could. With every car we removed the pollution bar would go down and our resources bar would increase. Once the resource bar reached the top a windmill appeared in the background and started to slowly decrease the amount of pollution clouds blocking our view. I also started to notice that as the pollution meter shrank, the scenery and environment became more lush and beautiful. The trees that were once dead and dark now had bright leaves. This made me feel as though I was making a difference at least in this virtual city. After the first level was over and we had gotten rid of all of the city's pollution the game congratulated us and showed our scores. My son had beaten me by about 500 points. The next day as I was driving him to the dentist, he was pointing out bigger vehicles on the road and suggested that we trade in our minivan for an environmentally friendly car. Finally playing a game has taught my son something worthwhile.

Content Plan and Production Schedule:

Meeting Times: Wednesday, 4:00-6:00pm in GCC 205
Saturday, 1:00-5:00pm in GCC 205
Sunday, 1:00-5:00pm in GCC 205

- **Saturday, February 20**
  - Research vehicles to use in the game, and have vehicle appearance and types chosen.
- **Sunday, February 21**
  - Have Vehicles picked
  - Have Behaviors defined
  - Have next phase of conceptual drawings complete
- **Wednesday, February 24:**
  - Begin **Design** Phase.
  - Jon, Aaron, and Gus: Begin Paper Prototyping
  - Joe: Have game music planned
- **Saturday, February 27:**
  - Jon, Aaron: have vehicles chosen to begin concept art.
  - Joe: have sound/audio necessities fully listed.
  - Gus: have asset list progress available for review.
- **Sunday, February 28**
  - Jon, Aaron: have developed some concept art for review.
  - Joe: have created audio for review.
  - Gus: have asset list and properties completely defined.
- **Sunday, March 7**
  - Jon, Joe, Aaron: begin changes to the reviewed first drafts of concept media.
  - Gus: Begin paper prototype
- **Sunday, March 14** (beginning of Spring Break)
  - Jon, Joe, Aaron: have complete concept media
  - Gus: have paper prototype completed
- **Sunday, March 21** (end of Spring Break)
  - **Design** phase is complete.
  - Accurately plan Develop and Deploy phases
- **Wednesday, March 24:**
  - Begin **Develop** Phase
  - Have a list of screens and tasks, as well as a node map, for paper prototyping
- **Saturday, March 27:** meeting from 1-3
- **Sunday, March 28:** meeting from 6-7.
  - Jon: 5 rendered vehicles
  - Aaron: environment improvements (clouds, personalization), began menu screen design
  - Joe: stub content for sound effects to be in paper prototype.
  - Gus: paper prototype menu skeleton

- **Wednesday, March 31:** meeting from 4-5
    - Review all progress
    - Jon: 7 rendered vehicles
    - Aaron: rendered menu screens (titles, clouds, buttons, etc.)
    - Joe: working music functionality in Flash for paper prototype.
    - Gus: gameplay prototype skeleton
- **Thursday, April 1:** during class
    - Jon: 7 additional fully rendered vehicles, colored silhouette shapes for the rest
    - Aaron: all of the environment improvements, menu screen designs (title, clouds, buttons, etc.)
    - Joe: music and sound effects, with dummy content for the rest.
    - Gus: fully functioning "paper" prototype in Flash
- **Friday, April 2:** Paper Prototype Testing
    - Begin setting up at noon
    - Testing from 1-7 (approx 1 hr/person).
- **Saturday, April 3:** meeting from 1-3
    - Compile testing results and create feedback summary.
- **Sunday, April 4:** meeting from 6-7
    - Paper prototype testing results are due
- **Wednesday, April 7:** meeting from 4-5
- **Saturday, April 10:** meeting from 1-3
- **Sunday, April 11:** meeting from 6-7
- **Tuesday, April 13:** class: Alpha Version Due
    - Have integrated prototype results into an Alpha version.
- **Wednesday, April 14:** meeting from 4-5
- **Friday, April 16:** Alpha Version Testing
    - Begin setting up at noon, begin testing at 1
    - 4 test subjects (approx 1 hr/person).
- **Saturday, April 17:** meeting from 1-4
    - Compile testing results and create feedback summary.
- **Sunday, April 18:** meeting from 2-4
    - Test results due.
    - **Design** Phase ends
    - Begin **Deploy** Phase
- **Tuesday, April 20:** class
    - Jon: the two partially rendered vehicles (Camaro and Smart Car) must be at a finalized state
    - Aaron: have made progress on the rope animation
    - Joe: a revised menu music track with bass and other various instruments, no solo instrument necessary, easy to loop
    - Gus: have the list prepared for the beta/final release
- **Wednesday, April 21:** meeting from 4-6
    - Jon: have one of the three remaining vehicles partially rendered

    - Aaron: have a fully functioning rough rope animation
    - Joe: have a finalized menu music track as well as a clear understanding of the remaining sound effects and tracks left to develop
    - Gus: have made clear progress in revising the code for the beta with best practices
- **Thursday, April 22:** class
    - Jon: have that vehicle fully rendered, with two left to go for the beta
    - Aaron: have a finalized rope animation, ready for the old man to be included
    - Joe: have a rough cut of the gameplay music, with various tracks/ideas for the different stages
    - Gus: have a working model with the newly revised code
- **Saturday, April 24:** meeting from 1-5
    - Jon: have the second to last vehicle fully rendered by the end of meeting time, with only one left to go
    - Aaron: have rough animations of the old man to be reviewed
    - Joe: have finalized gameplay music with the three various stages of intensity
    - Gus: have progressed in integrating the proposed final changes into the new code
- **Sunday, April 25:** meeting from 1-5
    - Jon: have the last vehicle fully rendered by the end of meeting time
    - Aaron: have animations of old man with rope finalized by the end of meeting time
    - Joe: have all sound effects necessary for gameplay ready to integrate into the server, as well as rough cuts of the game won and game lost tracks
    - Gus: have a functioning beta version with integrated changes to debug for Tuesday
- **Monday, April 26:**
    - Jon: have given all vehicle graphics and wheel and bounce animations to Gus
    - Aaron: have given all animations and modified game screens to Gus
    - Joe: have given modified menu track, gameplay tracks, and sound effects to Gus
    - Gus: integrating the newest assets into the beta candidate
- **Tuesday, April 27:** Beta/Release Candidate Due
    - Have a fully functioning beta candidate with all assets integrated
    - Determine what needs to be altered before testing on Friday
- **Wednesday, April 28:** meeting from 4-6

    - Everyone: alter anything necessary for the beta testing to happen on Friday.
    - Everyone: create a list of 5 names for testing purposes.
    - Create the testing prompts and tabulation chart for the beta version.
- **Thursday, April 29:** class: **FINALIZED ART AND ANIMATION**
    - Jon: all complete vehicle driving animations with spinning wheels, bounce, shadows, crushed states, electricity shock on Leaf, and activated glow are due.
    - Aaron: the recycling machine fully animated, sparks for the magnet hitting the street, people?
    - Joe: pollution animated for coming out of tailpipes, the overall smog, as well as the big clouds that will rise from the vehicles and join the overall smog.
    - Gus: a programmed game that is ready to integrate all of these animations.
- **Saturday, May 1:** BETA DUE
    - All artwork must be complete and integrated into a fully functional game.
    - Menu elements now get attention towards finalization.
- **Sunday, May 2:** by the end of the meeting from 1-5
    - Determine the final line of what needs to be altered for the final candidate, due in 4 days
- **Tuesday May 4:** class
    - The game must be complete, ready for 2 days of testing and debugging before the final candidate is due.
- **Wednesday, May 5:** Study Day
- **Saturday, May 8 – Tuesday, May 11, 2010**
    - Work on what needs to be done
    - Jon: work on the website for game.
    - Joe Aaron: work on design document.
    - Gus: finish coding and integrating.
- **Wednesday, May 12: FINAL CANDIDATE DATE**

Design Phase

The Game Title:

As with any good game, there must be a great game title. Here are the names we came up with:

- City Cleaner (working title)
- Smog Smitter
- The Green Geezer
- Green Geezer
- Clean Till You're Green
- Cranky Car Crush
- Green Grandpa
- Pollution Solution
- Emission Demolition
- Flog the Smog
- Smog Flogger
- Smog Flog
- Curmudgeony Car Crush
- Grandpa Goes Green
- Papa Pollution
- Eco-Geezer
- Green Senior
- Old Man Green
- Sen'ior Green
- Green Senior: Car Destroyer
- The Crane Game: Eco Version
- Green Gramps
- Gramps Goes Green
- Green Air Gramps

From there we narrowed the title down to five:

- Green Air Gramps
- Green Geezer
- Grandpa Goes Green
- Green Gramps
- Papa Pollution

From these five we voted on the final title: **Green Geezer**

Behavioral Outline:

- Welcome / “Splash” screen
    - Opening Cinematic plays
    - Presents the title of the game and two buttons: instructions and play.
        - Play takes you straight to the customization screen.
        - Instructions takes the user to an instructions / how to play screen that teaches the user how the game is played and how to win. After finishing reading through the instructions, the user clicks a button that takes them to the customization screen.
- Customization screen
    - Balloon color selection
        - Choices: red, blue, green, yellow, and purple. Selecting a choice highlights the option and, upon clicking, the game confirms the users choice, and the game begins. The user plays with the balloon that they chose. The balloon choice has no effect on the gameplay whatsoever, it merely changes the color of the balloon to the users liking.
- Loading Screen
    - Appears before gameplay. Pretty self-explanatory.
- Actual Game
    - Gameplay Elements:
        - The Navigation (The Old Man)
            - The Balloon
                - Colored according to the color chosen at the customization screen.
                - Used to navigate the screen and select a target vehicle.
                    - Targeted vehicles are shown with an outer glow around them.
            - The Magnet
                - The weapon used for crushing and hurling vehicles into the recycling machine.
                - Is dropped upon release of the finger from the touch screen or when the mouse is clicked. This initiates the crushing sequence.
                - If a crush is missed, or hits an eco-friendly vehicle, then there is a stall penalty for missing.
                - If a crush hits a bad vehicle, the vehicle is hurled into the recycling machine.

        - When hurling vehicles into the recycling machine, there is no aim required on the users part. It is completely automatic.
- Backdrop
    - The highway consists of four divided lanes. Traffic moves in both directions.
    - Trees and vegetation become greener with less pollution and brown with more.
    - There is a cityscape in the far distance that will become blotted out if pollution is not taken care of. Don't let this happen!
- Vehicles
    - Cars (sedans and sports cars)
        - Pollution released and points earned are relatively minimal.
        - Contribute little scrap metal to the recycling machine.
        - The more the player has cleans the environment, the less that appear.
    - Vans
        - Pollution released and points earned are greater than that of the cars.
        - Contributes scrap metal to the recycle plant, more so than cars
        - The more the player cleans the environment, the less that appear.
    - Trucks
        - Pollution released and points earned are greater than that of the vans.
        - Contribute a lot of metal to the recycling machine, more so than cars and vans.
        - The more the player cleans the environment, the less that appear.
    - SUVs and Hummers
        - Pollution released and points earned are greater than that of the trucks.
        - Contribute the most scrap metal to the recycling machine.
        - The more the player cleans the environment, the less that appear.
    - Eco-Friendly Cars (Smart and Electric Cars)
        - Cannot be crushed. The magnet merely bounces off the car and the player is stalled as penalty.

        - None appear to begin with until the player has done a sufficient amount of cleaning.
        - The more the player cleans the environment, the more that appear.
    - Pollution/Smog/Emissions
        - Grows as vehicles on the road release pollution.
        - If the sky is completely filled, the game is lost. The user is then taken to the "Bad Game Over" screen.
    - The Recycle Plant
        - Catches the crushed vehicles (no aim required of the user when hurling crushed vehicles into the recycle plant).
        - Collects scrap metal from the vehicles thrown in by the player.
        - The scrap metal collected is ejected by the plant and used in the construction of The Windmill.
    - The Windmill
        - Built gradually from the scrap metal the recycle plant pumps out.
        - Once built, the game is won and the windmill will blow all the pollution away. The user is then taken to the "Good Game Over" screen.
- The HUD
    - Points
        - Gained from time bonuses, on how fast the windmill is built, and which/how many vehicles were crushed, etc.
        - Points are lost when the player crushes eco-friendly vehicles.
        - Points cannot be lost when the user misses a vehicle.
    - Time
        - If and when time runs out, the game is lost. The user is taken then to the "Bad Game Over" screen.
        - A time bonus (such as 1 point per second leftover) is gained for winning the game.

- Game Over Screens
    - Will be good or bad, depending on whether the user successfully built the windmill (good) or if time run out or the screen is overrun by pollution (bad).
    - Displays the final score for the game.
        - Final scores will be saved to a high scores list and the user is encouraged to compete with others throughout the world for the biggest high score in the whole world.

- Encourages the user to play again with a play again button.
    - Selecting play again takes the user back to the customization screen.

Sound Outline:

- Welcome / “Splash” screen
    - Opening Cinematic plays
        - sound: cinematic sequence A plays
            - This is a compilation of various sounds – bird, bird_death, car_woosh, car_honk, old_man_surprised, old_man_tranquil, old_man_angry, old_man_foot_stomp, and various others.
    - Menu
        - sound: old_man_foot_stomp_plays till a selection is made.
        - sound: button click will play on click
        - The menu music starts to play after the opening cinematic and until the balloon is customized and the actual game begins.
- Customization screen
    - Balloon color selection
        - sound: button click will play on click.
- Loading Screen
    - Various old man noises will be played at random during loading.
    - Menu music will continue to play until game begins
- Actual Game
    - There are three music states that play throughout the game. One is the “normal state”, which plays while the player is progressing through the game, not necessarily doing good or bad, just… doing. There is also a “good state”, which plays when the user is on the verge of victory. Finally, there is the opposite of that, the “bad state”, which plays when the player is nearing failure. The last two states can only transition from the “normal state” – the music cannot transition from “good” to “bad” instantaneously, there can only be a gradual from “normal”, to “good”, to “normal”, to “bad”, or from “normal”, to “bad”, to “normal”, to “good”.
    - Gameplay Elements:
        - The Navigation (The Old Man)
            - The Balloon
                - sound: balloon fire igniting (you know, pulling the rope in a hot air balloon ignites a flame and causes it to rise in the air - that kind of fire ignition)
                - sound: balloon blowing up (as in blowing air into a rubber balloon, not exploding)
            - The Magnet
                - sound: magnet swung

        - sound magnet crushing vehicle
        - sound: magnet hitting road (misses vehicle)
        - sound: magnet hitting wrong car plays when the player hits an eco-friendly car.
    - The Old Man
        - sound: old man coughing from too much pollution
        - sound: old man grunting upon heaving magnet
        - sound: old man victory
        - sound: old man sad will play on miss
- Vehicles
    - sound: dopplar_effect
    - sound: vehicle_honk's 1, 2, 3, 4, and 5 will play at random
- Pollution/Smog/Emissions
    - If enough smog pollutes the screen, the gameplay song will go to the "bad state", signaling to the player that they are about to fail.
    - If enough smog is kept off the screen, the gameplay song will go to the "good state", signaling to the player that they are about to win
- The Recycle Plant
    - sound: recycle_bin_gulp will play upon car entering the plant
    - sound: recycle_bin process car will play when new car is generated
    - sound: correct_car will play if a non-eco-friendly vehicle is thrown into the plant
    - sound: wrong_car will play if an eco-friendly vehicle is thrown into the plant
- The Windmill
    - sound: windmill construction
    - sound: windmill construction complete
    - sound: windmill blowing

- The HUD
    - Points
        - The sounds for the recycle plant correct_car and wrong_car will signal to the player if they're gaining points or losing.
    - Time
        - sound: time_is_almost_up will warn the player if times about to run out.

- Game Over Screens

- The ending music will be fitting the ending achieved. The victory song will be played if the player wins the game, and the bad game over song will be played if the player fails to win the game.
- The old man sounds for sipping a glass of lemonade and rocking in his chair will play during the good ending.
- The old man sounds for coughing will be played when it's a bad ending.
- sound: button_click will play upon the user selecting play again or don't play again.

Technical Specifications:

Development Tools –

For the development of our game we will use an environment based around Adobe Flash and Actionscript. There are three main reasons why Flash and Actionscript are desirable for our application.

First, the resulting code and "player" are largely cross-platform compatible. Thus the number of people capable of using the game increases, and hopefully has a positive impact on distribution and use.

Second, the tools needed to develop and deploy a game using Actionscript are modest. While not open-source, the Flex toolkit is both free and readily available from Adobe. It appears to contain the capabilities we need to produce our game.

Lastly, Flash and Actionscript are both relatively familiar to us and our hope is that this will lead the development of the game to be faster and more efficient.

By creating our game using Actionscript and related tools, we hope that it will be at minimum playable on any computer (with a reasonably new version of Flash Player installed).

Content –

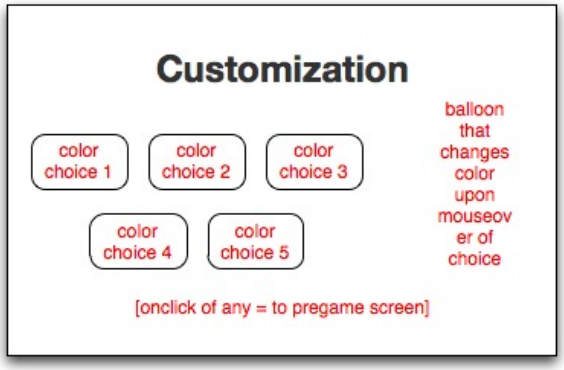
Vector images and shapes will be utilized for things such as the hot air balloon, the magnetic lifter, the cars, clouds, puffs of smoke, trees, windmills, etc.

Audio will be formatted to mp3 so that it is compatible with Flash. Sound effects should cover things such as car horns, metallic "clunks", windmill churning, birds, metallic crunching, general traffic noise, bonus sound, "good" sound, "bad" sound, etc. As for music, material that should be covered is introduction and exit music, music for the actual game play, and music for just the scoring/loading screens, etc.

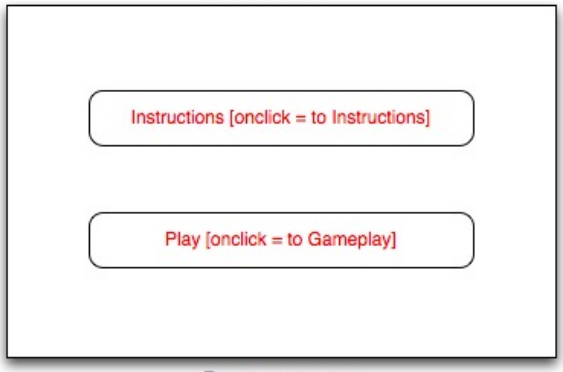
Raster Images will be utilized for anything that is not well suited to vector graphics.

Block Design:

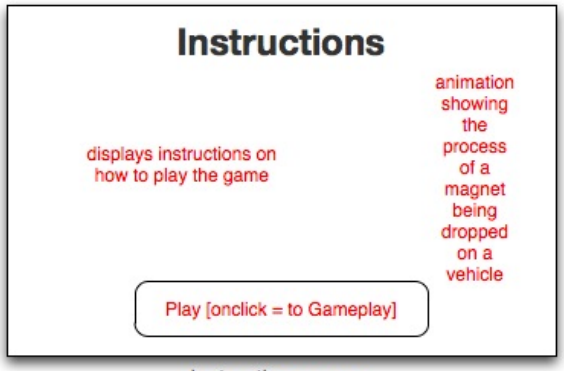
Welcome screen



Customization screen



Pregame screen



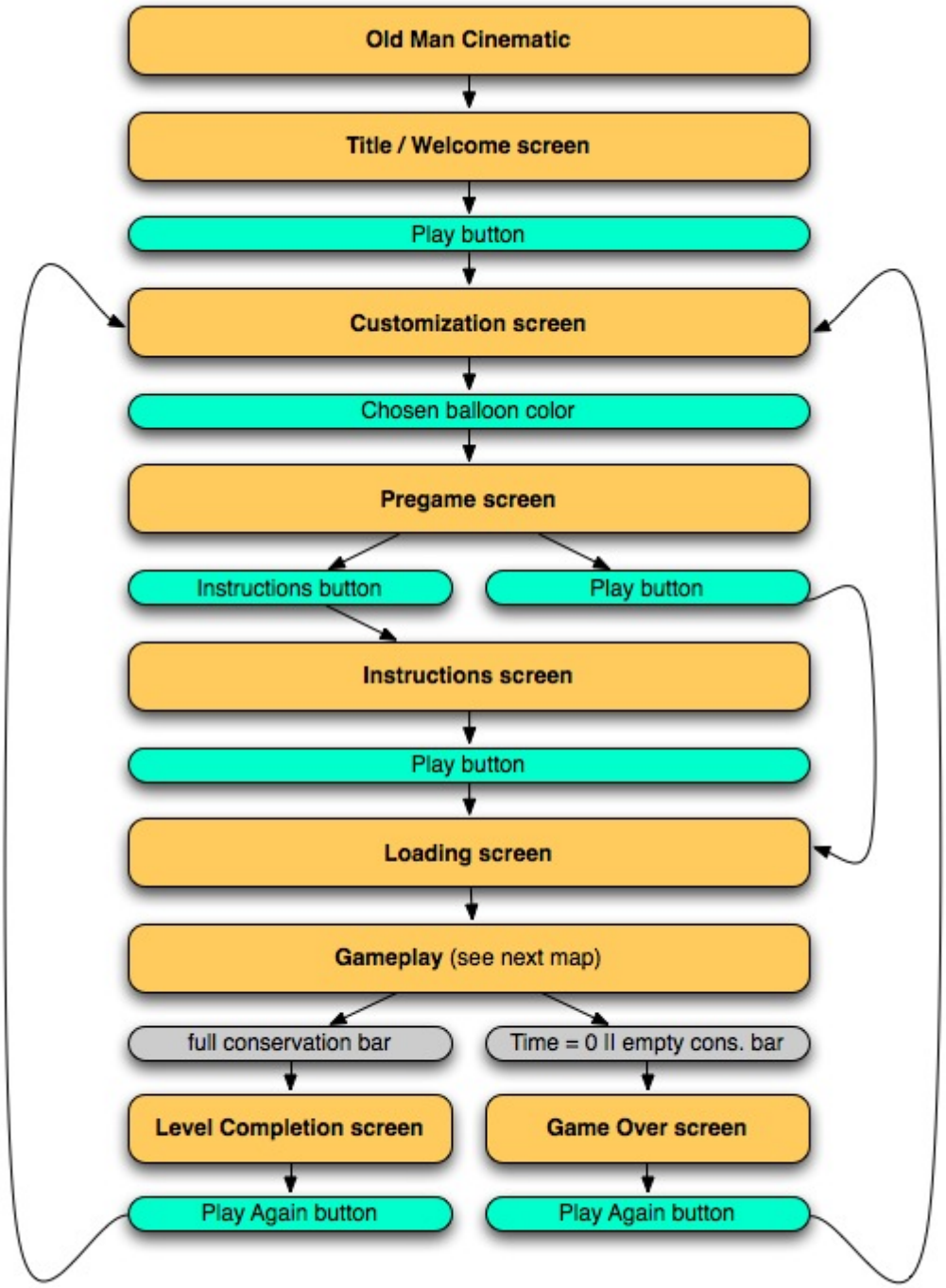
Instructions screen

Naming Conventions:
When uploading images into "Files," name them in this way:

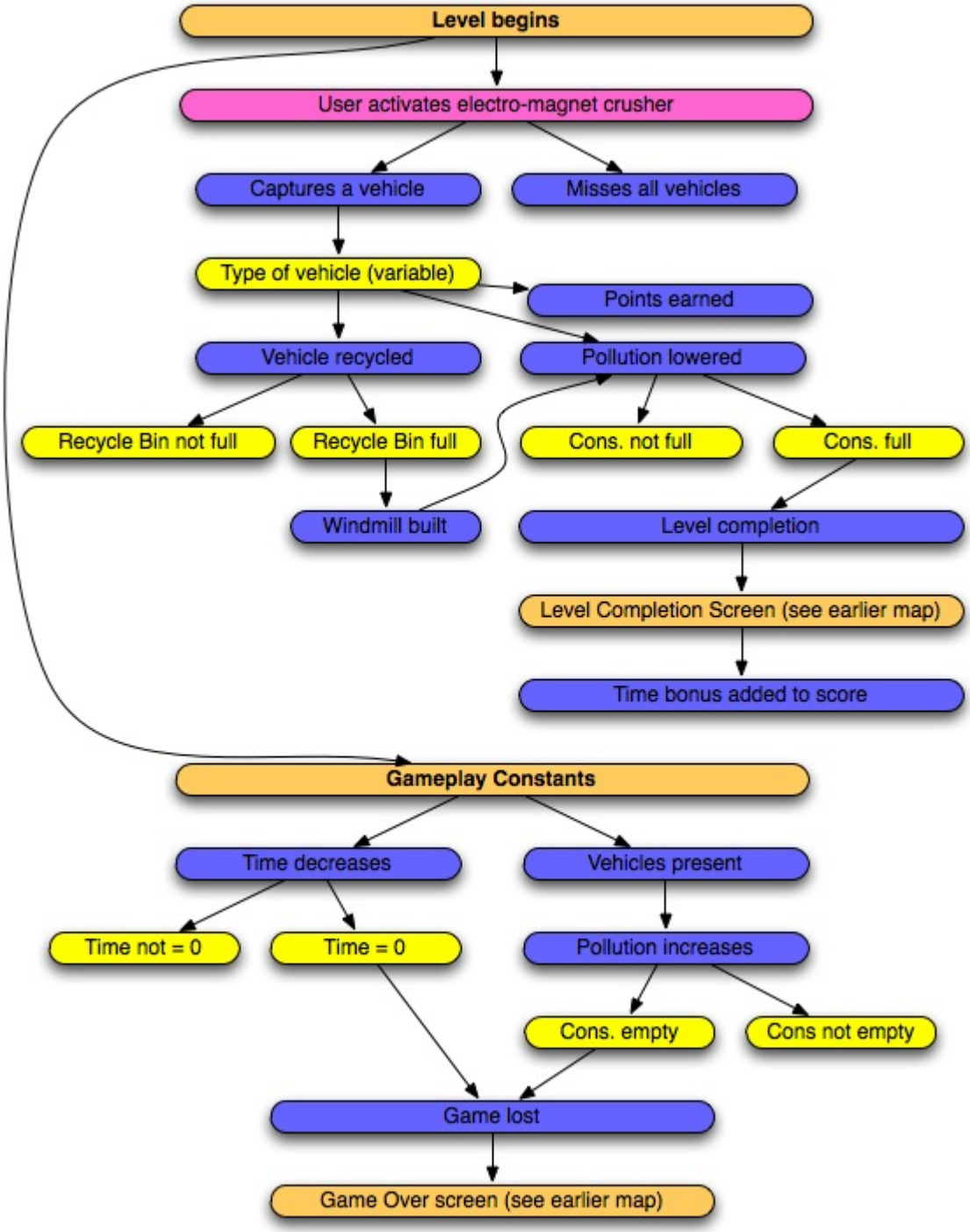
Screens: screen_screen name
screen names: welcome, players, customization, difficulty, instructions, levelcomp, gameover
example: screen_playdiff
Vehicles: vehicle_vehicle_state
states: full, crushed
example: vehicle_gallardo_full
Unique Elements: gameplayBackdrop, windmill, tree, pollution, etc.
Balloon: balloon_color_character
color choices: redwhite, bluegreen, yellowblack
example: balloon_redwhite_3

Node Maps:

Screen Navigation Node Map:



Gameplay Node Map:

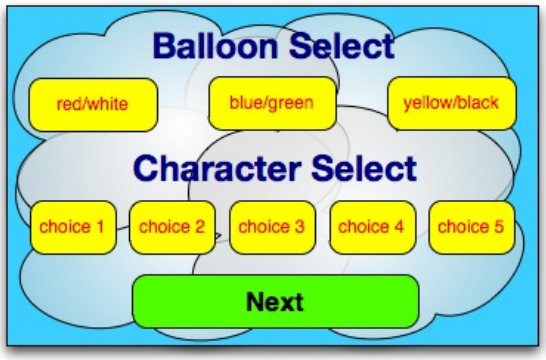


Static Interface and Storyboards:

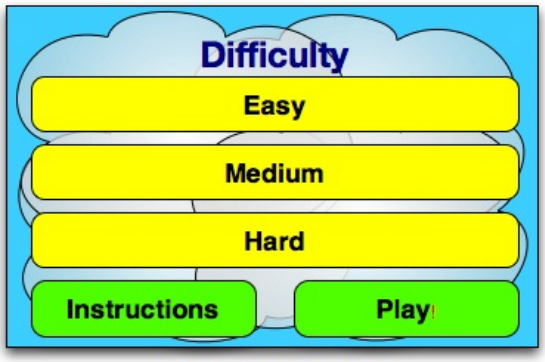
Storyboard:

Welcome screen (after load completion)

Player Selection screen



Customization screen



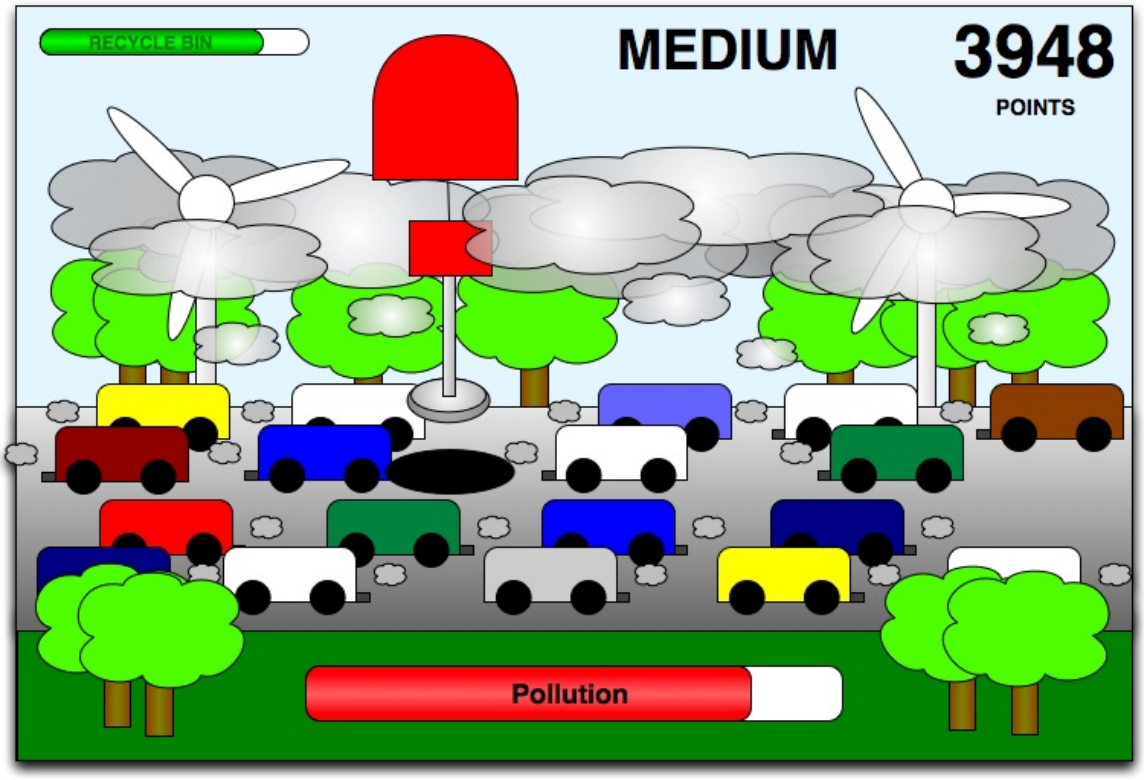
Difficulty Selection screen

Welcome Screen (after load completion)

Level Completion screen

Game Over screen

Static Interface:

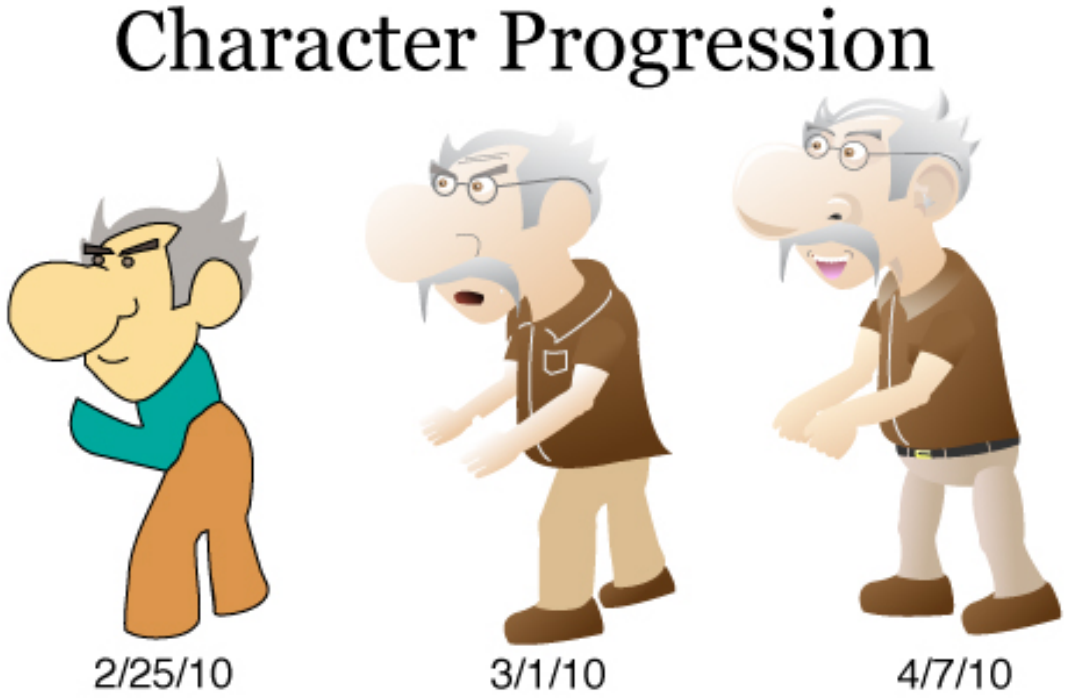


Sample Game Play Screen

A very rough draft of our interface, it was produced in omni-graffle, we aimed to show what the game would look like. The red umbrella-shaped object near the upper left is the balloon. Along side it, you can see clouds, representing smog, pinwheels, which represent windmills, and below are boxes on wheels, obviously representing the vehicles. The score is at that upper right of the screen, and some out of date ideas can also bee seen, such as the pollution bar/meter, recycle bin bar/meter, and difficulty (medium in this case).

Catalog of Progression

Graphics/Animation Catalog:

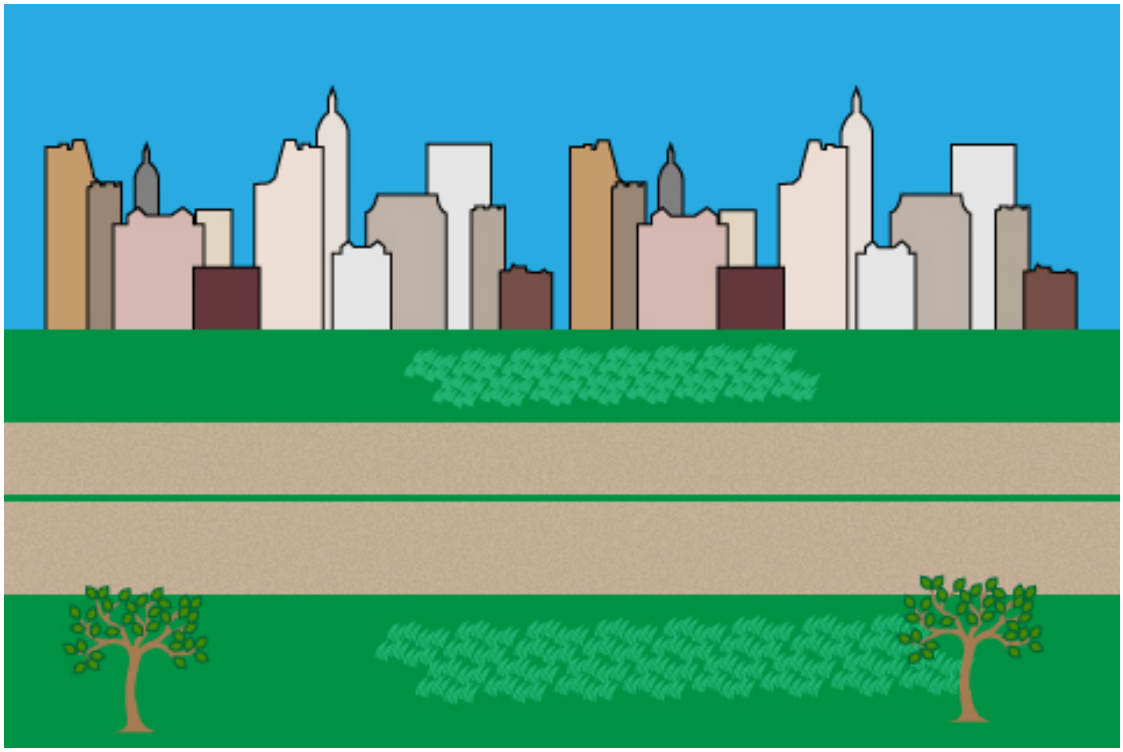


character progression

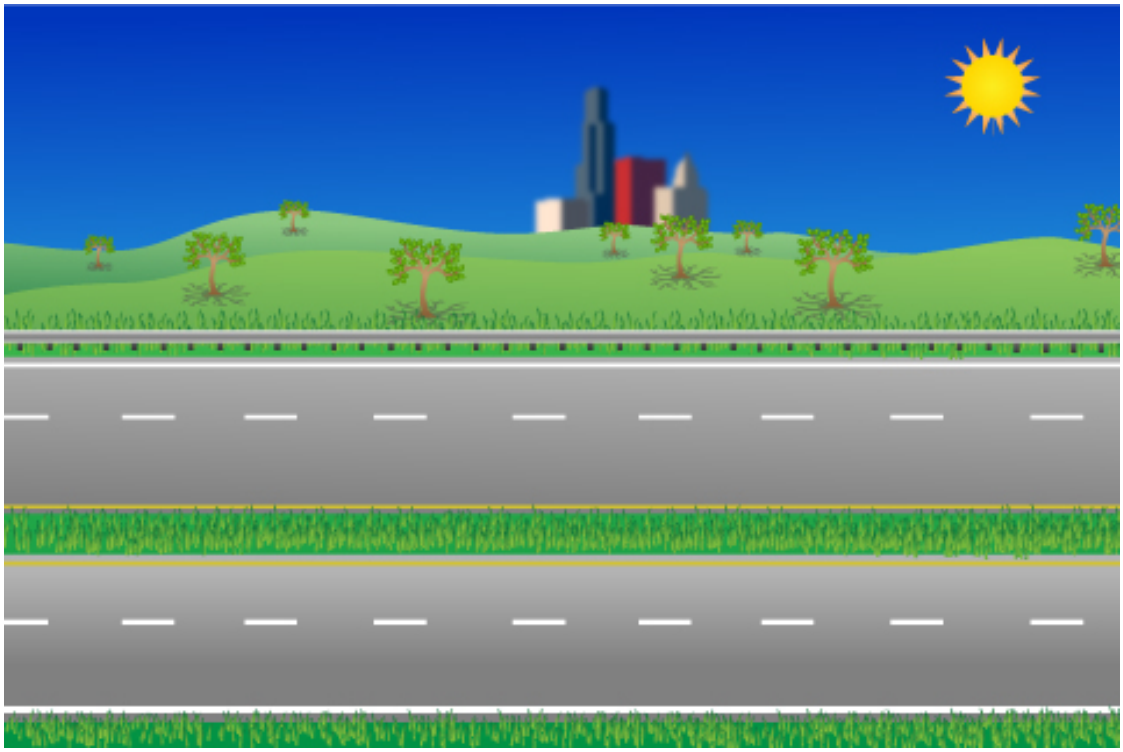
Character

The development of the character of this game was a challenge, but an essential step in the game. The first stages of design for the character were flat and lacked both detail and emotion. This is primarily because the designer of the character, Aaron Ingles, wasn't familiar with either Illustrator or designing characters for games at the beginning of the semester. The character needed to be fleshed out more because he was a huge part of the game's story and its gameplay. Aaron researched the shading and detail styles of other flash games and mobile applications used in their games and tried to create a similar but unique effect for our game. Many different body states and expressions had to be designed for this character to allow for expressive animation. The finished version of the old man character is successful at both becoming more expressive and much more realistically detailed.

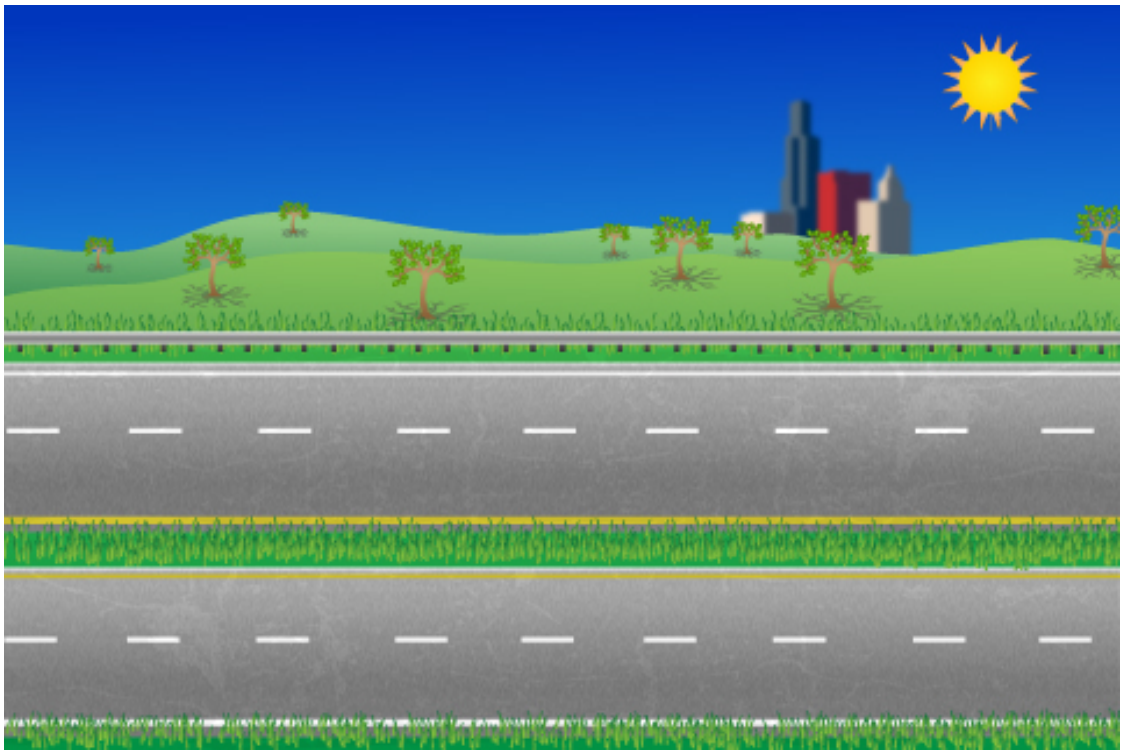
The Game Environment:



environment – first draft



environment – second draft



environment –final draft

Environment

The environment of this game was almost like a character itself. It had to change and respond to the gameplay and how the player was doing. The very early stages of the environment were flat and didn't allow for much dynamic change. The environment needed to become more immersive and personal. Many subtle details were added to it to make the user become more personally invested in both his involvement in this world and his influence on it. Many of the environments visually problems were solved by adding a subtle texture to things such as the road and the grass. The changes in the environment that were based on the pollution level were still very important. By adding things such as trees that would loose their leaves and by making the world looks as though it was suffering would relate to the player what effect the pollution was having on their world. These changes ultimately make the game work because if there was no sign or indication that the pollution was hurting the environment the why would you play?

The Title Screen:

start screen – first draft

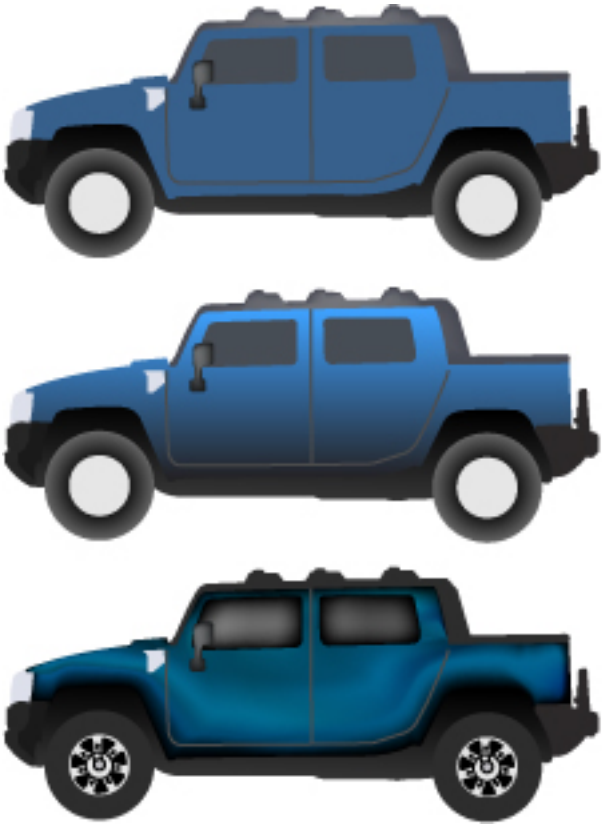
start screen – second draft

start screen – final draft

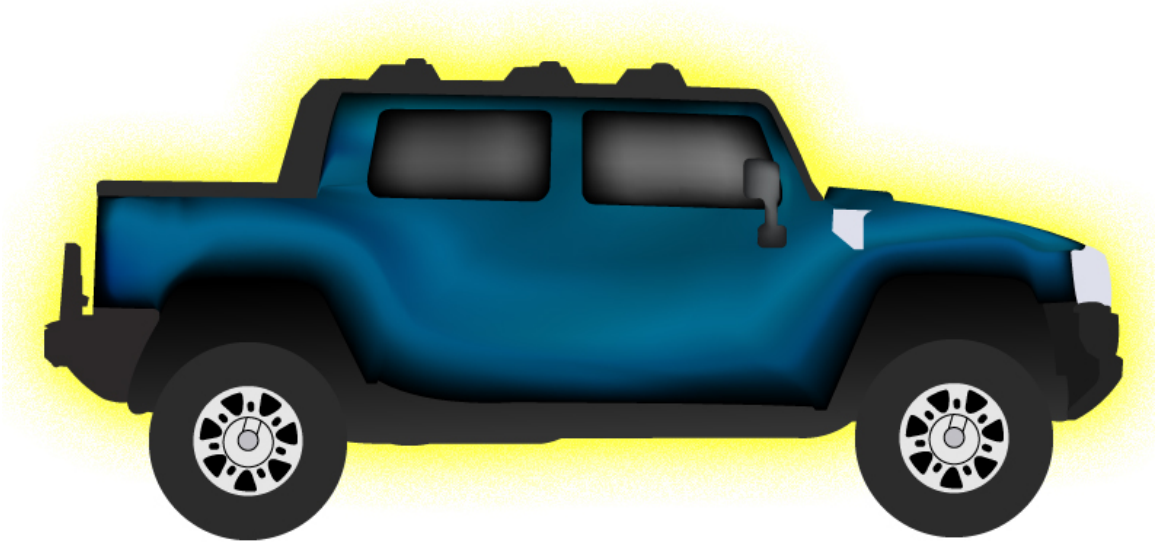
The Title Screen

The first game screens were primarily just placeholders for the early prototypes of our game, but we wanted to eventually have them tell the story of the old man and why he is on this quest. The way we were going to achieve this was by adding cinematic transition between and during our game screens. These small transitions made the game become more of a story of the old man. The story allows the player to understand how he ends up in his balloon and why he is removing cars from the road by showing the man's relation to the polluting hummer at the beginning and the effect it has on his home, the player understands why they must remove these sort of vehicles in the actual gameplay. The ending sequences of the game also show the player the influence they've had on the old man's life. All of this allows the player to become more emotionally invested in the game.

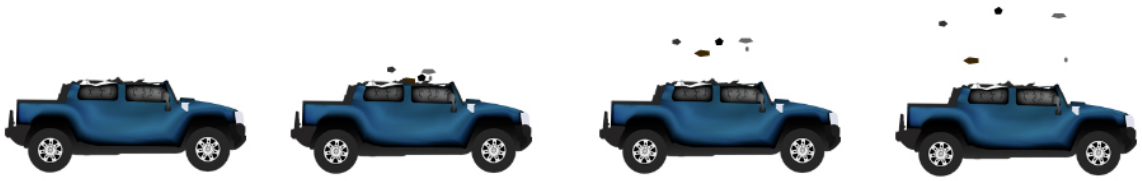
The Vehicles:



evolution of the vehicle



the glow state of the vehicles

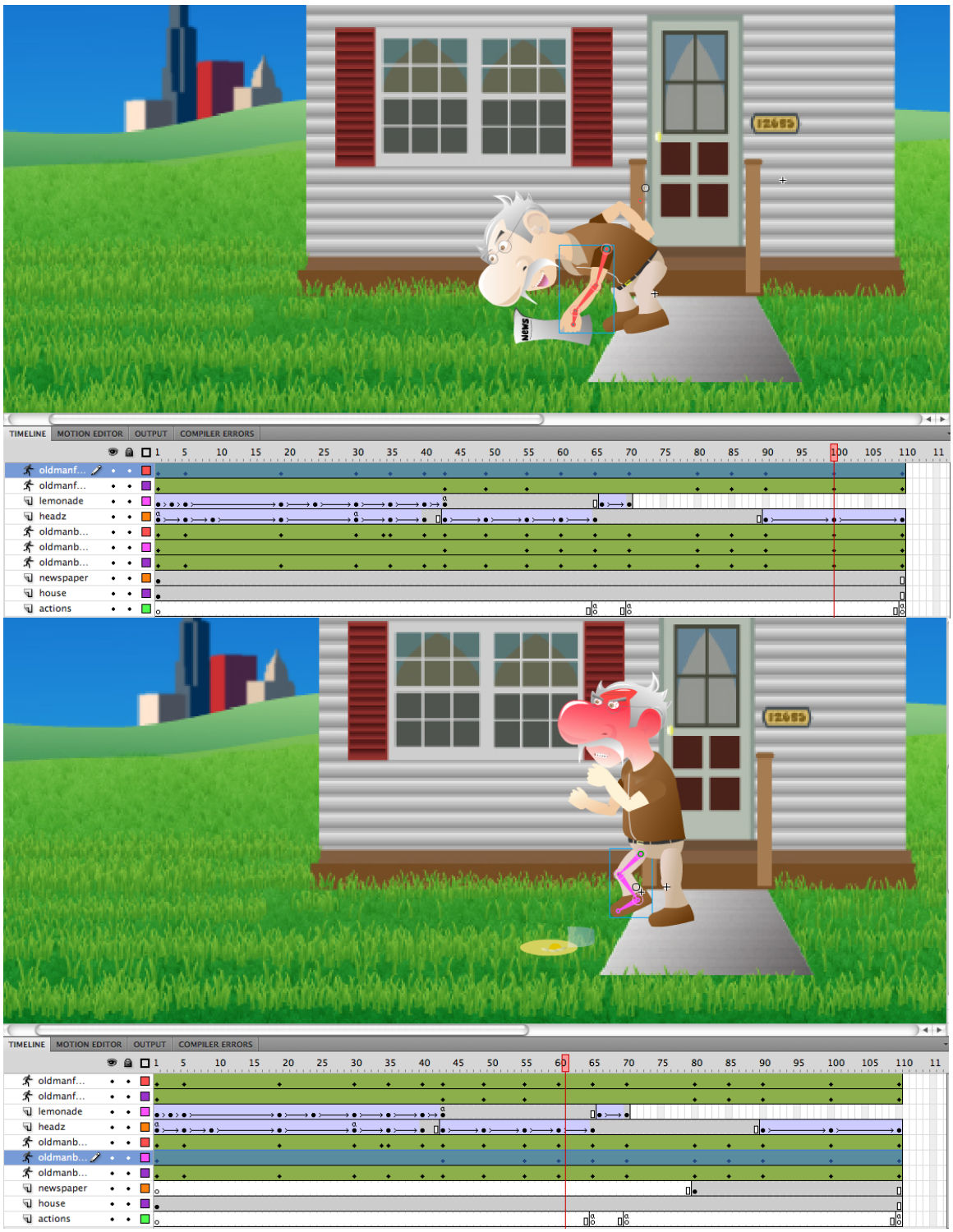


The crushed states of the vehicles

Vehicles States:

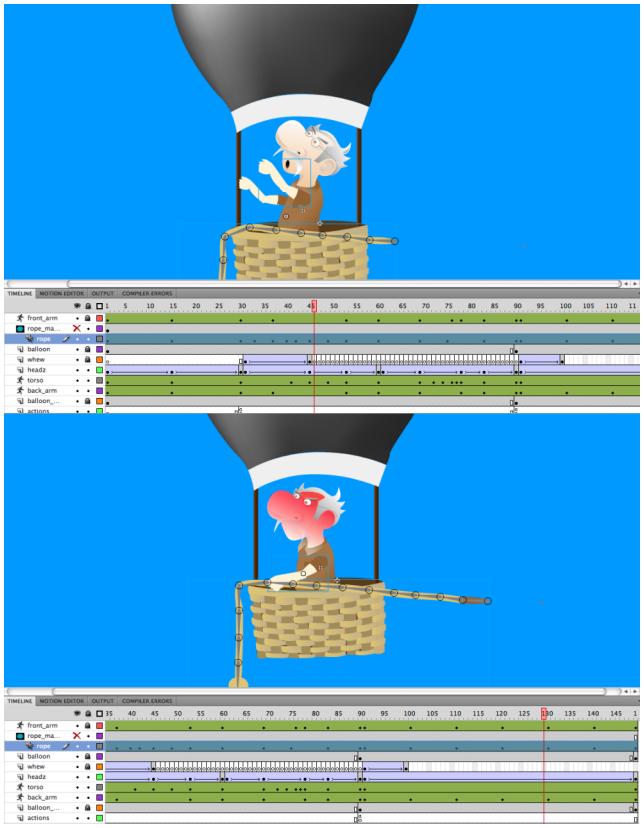
When the vehicles were first created they only had basic details designed into them. As Jonathan progressed through the semester he improved the look of them by shading them and adding more small details. The vehicles are a major part of the game as they are part of the overall theme. Each vehicle in the game has multiple states. The first is the normal driving state. This state is animated with the wheels spinning and vehicle moving horizontally across the screen. The animation also has a slight vertical up and down movement as if the vehicle was driving on unsmooth pavement. Small details like this make the game more immersive and realistic. The second state is the highlighted state. This state happens when the player has the magnet directly over the vehicle. This allows the player to know what vehicle they are about to crush along with when to crush it. The third state is the crushed vehicle state. After the magnet makes contact with an inefficient vehicle it switches to this state. Crushed vehicle designs are made to look as if the magnet has dropped on top of them. An animation is played that shows small pieces of the vehicle flying off. This gives players the feeling they are really crushing the vehicle and gives a feeling of accomplishment.

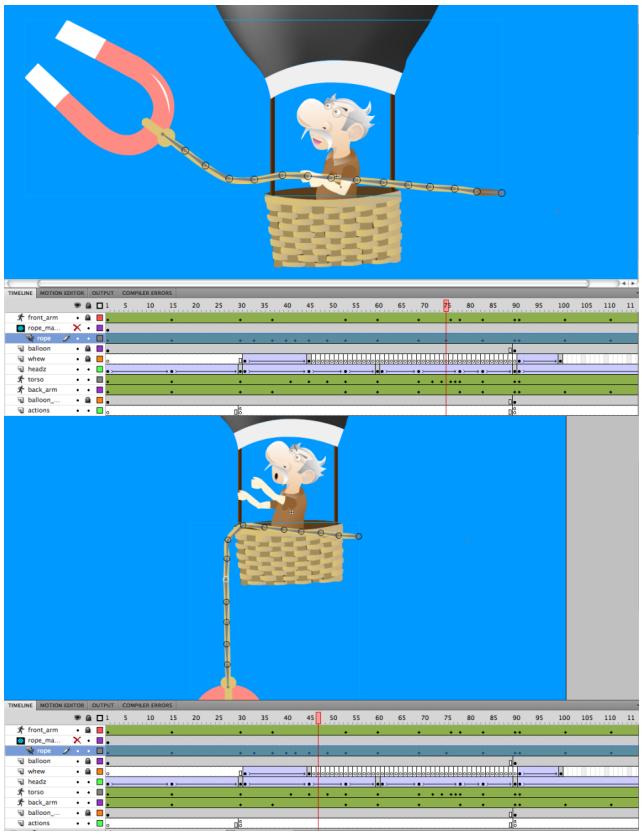
The Animations:



intro animation

game over animation





old man animation – magnet throw

Animation

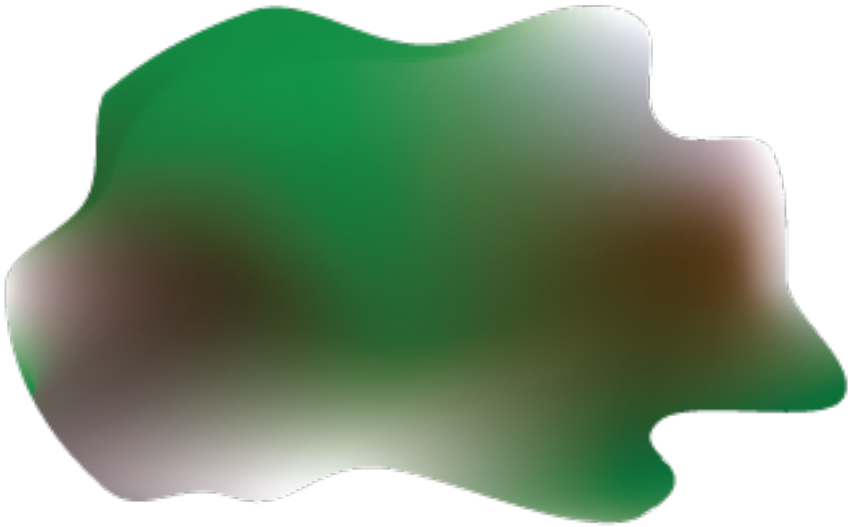
Animation gives any game more life and personality, which is why it was incredibly important for us to have fitting animations for nearly part of the game. Most of the game's animation was made possible by Flash's bone tool which uses Inverse Kinetics to make realistic and believable animation. This allowed for the animations of the old man both in gameplay and in the cinematic game screens to be more believable and fluid. Many of the animations were added to give the game's environment more depth and to show the effect of each car being removed. The tree's swayed back and forth and lost their leafs as the pollution gets worse. With each car that is recycled there is an animation of both the car being gulped down by the recycle machine and small portion of the game's windmill is built. Each animation that was added would provide that game with more depth and personality.

The Smog:

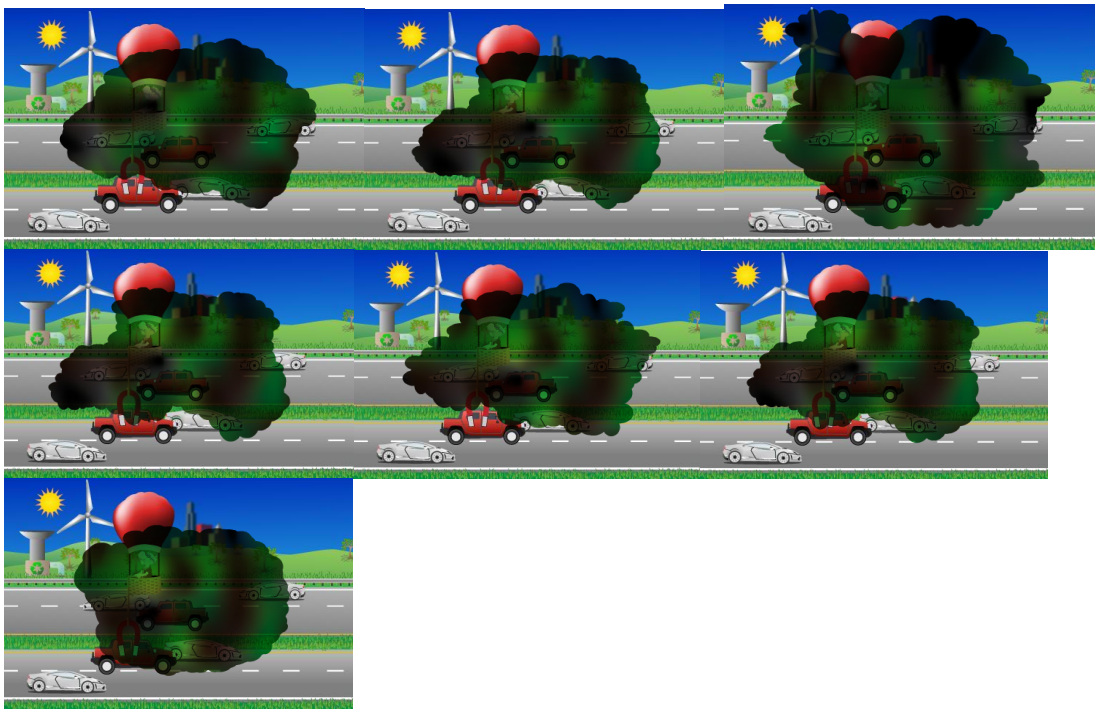
Went for a realist approach at first…

and it didn't really fit the aesthetic of the game.

Using this as a background, and cloud shapes as meshes, the pollution the user now sees in the game was achieved.



two examples of what was achieved by this approach.



The smog cloud morphing animation

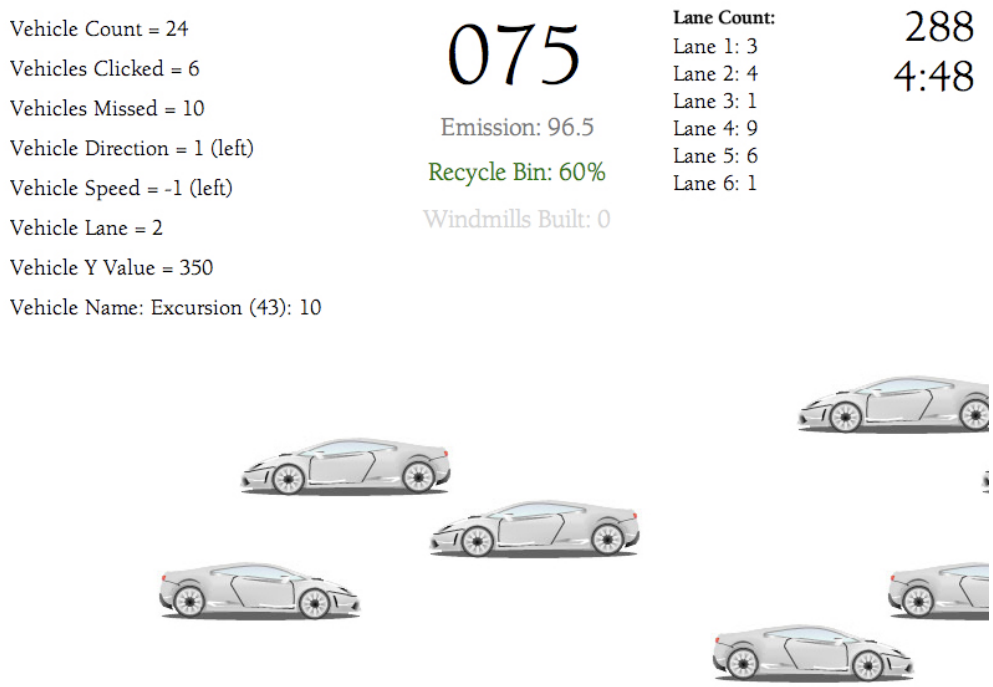
The Smog Animation

Joe wanted something that looked toxic and, by combining shades of green, brown, and grey, and then using the layer style “multiply” Joe get the desired result.

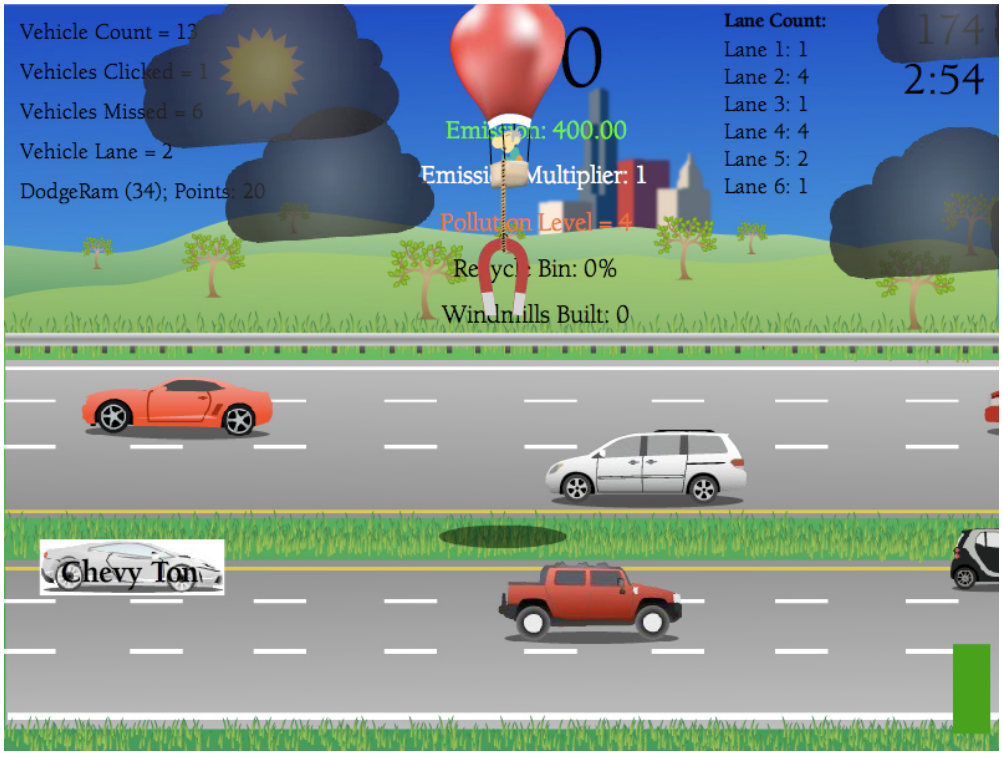
As for creating the morphing effect, Joe merely used shape tweening between various cloud states he had created in Flash (using circle tool), and then making those cloud states a mask over the constantly moving smog mesh (seen two pictures up on page 36). This mesh, as stated before, constantly moves in various directions, only to return back to its original position for the purpose of looping. The clip had to be over 300 frames long for the sake of no duplicate smog clouds, and each cloud would emit from the tailpipes of bad vehicles at a random frame from that smog movie clip.

It’s rather ingenious.

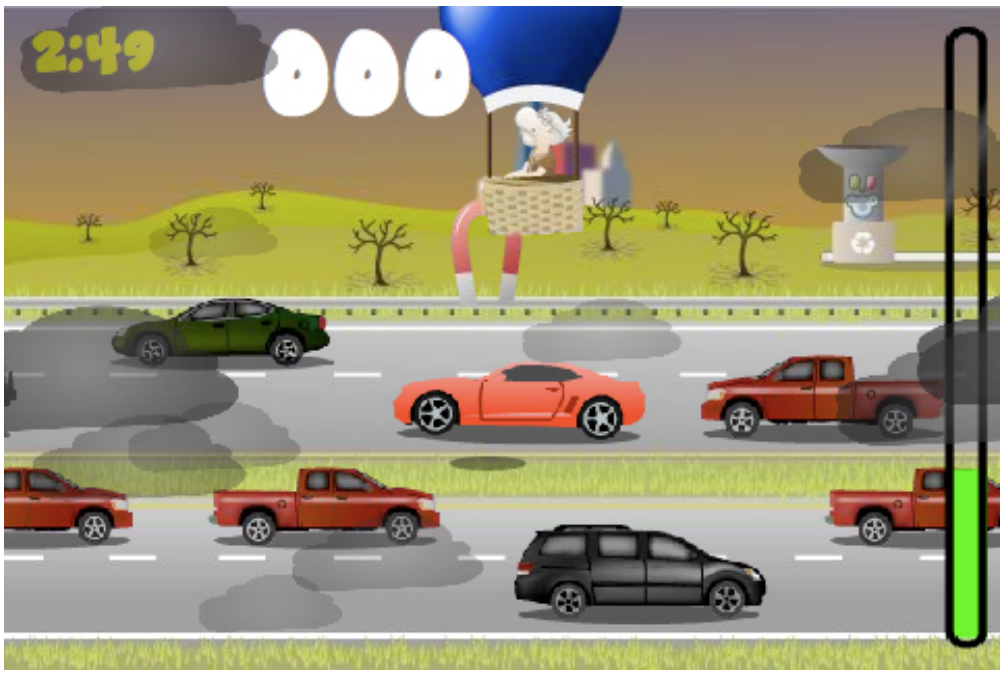
Code Catalog:



first phase of development



second phase of development



third phase of development

fourth phase of development

Sound/Audio Catalog:

It's hard to take pictures of sound, so this section has no screenshots.

Pertaining to the music, Joe went through two previous set lists for songs till he struck gold with the third. Usually composing songs of a faster, more aggressive variety, such experience and tastes could be seen in his early works. While they were excellent compositions in and of themselves, they did not meet the criteria of the game. Thus, Joe started on the second set. This set had a groove to it, but the dark ominous overtone still lingered and the second set list lacked that jovial ambience we so desired, so, once more, an entire set list was scrapped. Finally, Joe struck gold in his third set list, taking a less serious tone with his work and illustrating a more jovial, upbeat, almost "elevator music" approach with his musical melodies and rhythms. He has since taken the original songs and made transitions between each and various states of the gameplay one. The Heavenly state, as he so calls it, is for when the player is on the verge of victory, utilizing a trance-esque synthesizer as the main melody to further brighten the already bright mood. The Hell state, as he calls it, is the complete opposite, drawing from his previous dark works, it's chugging electric guitars and bass combined with an alarm envelope the anxiety the user should feel when they are on the verge of defeat. As for his victory music, Joe says that he draws inspiration from the Star Wars films and the final score from Beast Wars Transformers, and it definitely shows. His failure music for when the user fails to win the game is actually a leftover from the second set-list, figuring, "if my music was depressing before, and the user has to feel depressed after losing, then I might as well use the best from one of my previous set lists"

As for the sound effects, Joe had previously recorded sounds for other projects he had done in the past, and some of those sounds, such as the balloon ignition fire, footsteps, and metal clanking, are in our game. He had to record the sounds for the recycling plant, drawing inspiration from a variety of areas. For a realistic feel, he traveled to a local junkyard, outside of Bartonville, IL, where they compact cars into scrap and recorded such an occurrence. He then combined those sounds with various sci-fi sound effects he has accumulated through previous works and made all new ones for our recycling plant. As for the old man, his coughing, speaking roles, all of it is Joe himself. Other sound effects, like when the user clicks a button on the menu, are sounds Joe composed using GarageBand and a MIDI interface.

Testing

Paper Prototype

Results:

Fast Rocket - Paper Test Data Tabulation: as compiled by DJ DAK
n/a =- some results were not recorded
*There were seven testers

Title

Clicked Play	7	100%
Didn't click Play	0	0%

Customization

Red	3	43%
Green	2	29%
Blue	2	29%
Yellow	0	0%
Purple	0	0%

Difficulty

Easy	4	57%
Medium	3	43%
Hard	0	0%

Instructions

Clicked	7	100%
Didn't click	0	0%
Thoroughly read	5	71%
Skimmed	2	29%
Confusion Level		
1	1	14%
2	5	71%
3	0	0%
4	1	14%

Loading

Thoroughly read	6	86%
Skimmed	1	14%

Patient	7	100%
Impatient	0	0%

Gameplay

Understood Mission

1	0	0%
2	1	14%
3	2	29%
4	4	57%

Understood Clouds

1	1	14%
2	1	14%
3	0	0%
4	5	71%

Vehicle Removed

red truck	1	14%
red hummer	4	57%
smart car	1	14%
n/a	1	14%

Decent Gameplay

Did well	7	100%
Didn't do well	0	0%

Understood Windmills

1	0	0%
2	0	0%
3	3	43%
4	3	43%
n/a	1	14%

Vehicle Removed

red truck	2	29%
red hummer	4	57%
n/a	1	14%

Screen Frequency

1	0	0%
2	0	0%
3	0	0%
4	1	14%
5	2	29%
n/a	4	57%

Bad Gameplay

Did well	3	43%
Didn't do well	4	57%

Understood Darkness

1	0	0%
2	1	14%
3	1	14%
4	4	57%
n/a	1	14%

Vehicle Removed

smart car	3	43%
hybrid	1	14%
red hummer	1	14%
n/a	2	29%

Screen Frequency

1	3	43%
n/a	4	57%

Good Gameplay

Did well	6	86%
Didn't do well	0	0%
n/a	1	14%

Understood Windmills

1	0	0%
2	1	14%
3	3	43%
4	1	14%
n/a	2	29%

Vehicle Removed

red truck	3	43%
red hummer	3	43%
n/a	1	14%

Screen frequency

5+	3	43%
n/a	4	57%

Game Lost

Understood why

yes	4	57%
no	0	0%
n/a	3	43%

Game Won

Understood why

yes	5	71%
no	0	0%
n/a	2	29%

Executive Summary:

Fast Rocket
Paper Test – Executive Summary
As prepared by DJ DAK
4/4/10

On the whole, the seven users who tested City Cleaner enjoyed their experiences. All had constructive criticisms to offer, which appear in no order.

They didn't feel this game was challenging enough for students our age. Most thought it would be good for pre-teens or maybe even high-schoolers. To go with this thought, people with iPods or iPod Touches thought they would delete this app after playing it once or twice.

Users weren't satisfied that the game ended based on winning or losing. Instead, they wanted a more compelling replayability factor.

They also associated colors with various elements. For example, they automatically thought all red cars were bad cars. Users also thought dark exhaust was bad while white exhaust was good.

All users commented about the personality of the old man. They wanted to know why he was grumpy. Instead of being static, they would enjoy seeing him speak or move around in his balloon as he was cleaning up.

Finally, users wanted to see the conservation meter change to a vertical progress bar instead of textual numbers. They didn't explicitly mention a vertical orientation, but drew it in the air with their hands.

As an honorable mention, no user could remember the title. They thought it would be better if the game actually took place in a city, or if the name changed to reflect the location or the old man.

While they made suggestions, users had a lot of positives to say about the game. Nobody had anything bad to say about the artwork. They liked the detail of the cars and the scenery, but thought the balloon could stand out more.

Everyone liked the ability to choose the color of the balloon. The only negative response was one user wanted to see purple added.

Usually, users avoided choosing environmentally safe cars. This means that they understood the theme of cleaning up the environment.

The background music during gameplay was something they enjoyed.

Everyone who had an iPod or iPod Touch said they would download this game to try it out, but only if it was in the Top 25. Nobody said they would actively search for it.

In summary, users enjoyed being a part of the testing process and thought this game had good potential, but they want to see several key improvements before it is released.

Prioritized List – Things To Change for the Alpha:

Fast Rocket's “City Cleaner” – working title

1. settling the iPhone question once and for all
   - does this mean the death of the air balloon in gameplay?
2. finalizing incentives to encourage replay longevity
    1. a vertical conservation meter
        1. empty when beginning and filled to win
        2. possibly visual notches to separate pollution levels
            1. could reduce necessity for a potentially confusing “recycle bin”
            2. could clarify why windmills are even involved (should they be?)
            3. would clarify when the switch between environment visuals switch
        3. when full, game ends with a large bonus depending on time
        4. raised by crushing appropriate vehicles
        5. lowered by excessive pollution or crushing inappropriate vehicles
    2. level timer
        1. upon winning, provides a time bonus
        2. when ran out, the game is over
3. clearly indicating which vehicles are good and which are bad. possibilities:
    1. visual feedback of immediate point additions/deductions
    2. auditory feedback of positive or negative sounds
    3. penalties such as electricity stunning/etc
    4. a variance of smog coming from the tailpipes
4. creating a dynamic personality for the old man
    1. a voice, reactions, and facial animation
        1. “why is he grumpy?”
5. decide on demographic
    1. fast paced challenging game for older folks (too basic of a theme? too “cute”?)
    2. educational? middle-high school? factual pop ups?
6. increasing the difficulty of the game (more fast paced, dependent on timer)
7. creating pollution congruent with the rest of the art (keep them dark)
8. increasing the variance of vehicle colors
9. creating a list of testable names
10. choosing a better font and title graphics congruent with art
11. include a reaction when missing vehicles

Alpha Test

Results:

Fast Rocket – Alpha Test
Data Tabulation
As compiled by: DJ DAK

Title		
Art appreciation		
3	1	25%
4	3	75%
	4	100%
Understood man's anger		
2	3	75%
3	1	25%
	4	100%
Read Instructions		
Yes	2	50%
No	2	50%
	4	100%
Clarity of Instructions		
4	1	25%
5	3	75%
	4	100%
Customization		
Color chosen		
Red	2	50%
Green	1	25%
Blue	1	25%
Yellow	0	0%
Purple	0	0%
	4	100%
Gameplay		
Understood mission		
5	4	100%
Underestood clouds		
3	1	25%
5	3	75%
	4	100%
Understood meter		
1	1	25%
3	1	25%
4	2	50%

	4	100%
Understood recycling		
2	2	50%
4	1	25%
5	1	25%
	4	100%
Vehicles too fast		
Yes	2	50%
No	2	50%
	4	100%
Vehicles too slow		
Yes	1	25%
No	3	75%
	4	100%
Understood windmills		
3	2	50%
5	2	50%
	4	100%
Understood progress		
3	1	25%
4	1	25%
5	2	50%
	4	100%
After Gameplay		
Times played		
1	2	50%
2	2	50%
	4	100%
Understood win/loss		
Yes	3	75%
No	1	25%
	4	100%
Times won		
	2	100%
	n/a	
	2	100%
Times lost		
	5	100%
	n/a	
	5	100%
Understood old man		
2	1	25%
3	1	25%

4		2	50%
		4	100%
Game too easy			
Yes		2	50%
No		2	50%
		4	100%
Game too difficult			
Yes		1	25%
No		3	75%
		4	100%
Understood theme			
5		4	100%
Artwork appreciation			
4		1	25%
5		3	75%
		4	100%
Sound appreciation			
	3	1	25%
	4	2	50%
	5	1	25%
		4	100%
Will this be fun?			
	3	3	100%
Level of appeal			
	5	1	25%
	7	1	25%
	8	2	50%
		4	100%

Executive Summary:

Fast Rocket
Alpha Test – Executive Summary, extended
As prepared by DJ DAK
4/18/10

A total of four diverse users seemed to enjoy testing City Cleaner. All had constructive thoughts on the game, which appear in no order.

Users generally thought the cars needed to move faster as the game went on. Toward the end of the level, the amount of bad cars was so minimal that gameplay seemed to drag on.

Additionally, some elements didn't stand out enough for the user to interpret them on their own, and needed to be pointed out by the moderator. Nobody noticed the conservation meter to the side, perhaps because it blended in too much. Nobody noticed the recycling bin either. Nobody drew the conclusion that the recycled car material produced the windmills. Finally, testers didn't understand what connection or purpose the old man served within the game. They especially didn't get why he wound up in jail when the user lost the game.

Users were generally confused at first when trying to pick up cars, but came to find out how to do it through trial and error. Several tried to hover over and use the magnet itself, until it dropped down even further. They also didn't think using the shadow as a target was effective behind the dark polluted clouds.

Like the paper/Flash test, nobody remembered the title at the end of the game. Maybe it's not catch enough, or maybe they weren't paying attention.

Definitely, though, they thought it should stand out more on the title screen. Users thought the title looked too much like the Instructions and Play buttons.

Lastly, users were confused about which cars caused pollution. Most gathered the Hummer was good and the Prius and smart car were bad, but it varied in the middle. Some picked up the truck or the sports cars, and some didn't. Some picked up the blue and green cars, and some didn't. Only one tester fully understood which cars are considered bad for the environment and which ones are considered good.

Users enjoyed other aspects of the game more. They thought the cars traveled at about the right speed and thought the artwork was really good. Everybody clearly understood the mission of the game, possibly because they thought the instructions were clearly laid out. They also understood the pollution clouds.

Overall, users seemed to enjoy the ability to test out a game and offer their input on how to improve it.

Fast Rocket's List of Revisions for the Beta and Final Versions:

Based on alpha testing results and our own observations:

12. a very clear distinction must be made between good and bad vehicles
    - animated pollution coming from the tailpipe
    - more visual feedback when vehicles are crushed
13. the purpose and visibility of the conservation meter and recycling bin made more clear
    - including a clear explanation of how/why windmills are built
14. make the balloon/magnet's shadow and it's purpose more clear
    - point it out in the instructions?
    - make it bigger? Darker?
15. the old man's role needs to be clarified and personality expanded
    - the “Game Over” jail scene must be rethought
    - audible sound effects should help
    - a little back story included in the instructions?
16. more information in the instructions, but they can't get any smaller
    - multiple screens that are clicked through?
    - more explanations of various game elements
17. the speed of vehicles must noticeably increase as the game goes on
    - but the beginning speed is appropriate
18. more bad vehicles in the end of gameplay so it doesn't drag on
19. we need a title... seriously.

Beta Test

Results:

We actually had no formal beta test. The course instructor, Jim Ferolo, merely evaluated our betas himself and asked us to compose a list of things that are to be done from the end of the beta, to when the final draft is due. Here is that list…

Fast Rocket

Final Candidate Task List

4/01/2010

Prioritized Rating Scale

20. It has to happen
21. It would be nice
22. We're dreaming

Numbers in parenthesis represent the estimated time required to complete the task.

Group List

- 1 – Rename the game
- 1 – Launch/download webpage and/or print ad (3)
- 1 – Design document revision, compilation, and binding

Aaron: Game Screens and Environment

- 1 – Animate a quick transition for the beginning of gameplay: begins on the best environment, many cars speed by and pollute until the environment quality has decreased one level, then gameplay will begin (3)
- 2 – Make all screens have smooth transition and animated into a story; cinematic

Improve Title Screen

- 1 – Finish details of the house (1-2)
- 1 – Add updated details to the rest of the environment to match the new gameplay graphics (:30)
- 1 – Button pollution congruent with the gameplay smog (:10)
- 1 – Provide depth in the title (:10)
- 2 – Dead/dying birds in his yard (:30)
- 2 – Make it slightly animated - ie. car driving passed releasing pollution, old man shaking his hand (3)

Improve Customization Screen

- 1 – Add details from the intro screen's house to this screen as well (:05)
- 1 – Update other graphics just like in the intro screen (:05)
- 1 – Consistent smog and title depth (:30)
- 2 – Animation: moving old man to each bucket with a paint brush in his hand; post-selection animation (3)

Revamp and improve instructions with animations

- 1 – Incorporate a clever way to show instructions to the user like in the customize screen - if the instruction button is clicked then a newspaper is thrown at the old man and it switches to a first person view of him looking at it and the newspaper would inform him about how to play the game and his goals. Multiple screens, animations demonstrating various gameplay elements: vehicle crush, windmill build (4)
- 1 – Upgrade other visuals to be on par with the other game screens (5)
- 2 – Slight animations: throwing of the newspaper - bring the newspaper to his face - animations on the newspaper page to show what removing a car looks like (2)

Revamp and improve possible loading screen

- 2 – Need to think of an animation or transition to incorporate into the loading screen

Revamp and improve ending screens

- 1 – Game Won Screen – the old man is sitting in his rocking chair, sipping his lemonade - efficient cars are driving by his home - potentially a newspaper is delivered with the article being about his great efforts to improve the environment - also shows his score (4)
- 1 – You Lose Screen Idea - need to think of

Environment

- 2 – Adding texture in the hills (2)
- 2 – Adding animated animals - birds, squirrels (3)
- 3 – Adding sway and stages to the grass, similar to the tree (?)
- 3 – Adding littering from the cars potentially, could potentially add into the worst environments (2)
- 3 – Adding the leaves falling from the trees as pollution gets worse and have them sprout back out when the environment gets better (2)

Gus: Gameplay and Programming (all 1)

- Variable vehicle speed with detection and reaction (1 with Harry)
- Content Integration
  - newest music and sound effects (5)
  - game screen graphics and animations (10)
- Restructure gameplay: begins with better environment, gets worse as gameplay continues, never better, until the game is won, the windmill blows away the pollution (4)
- Perfect the scaling of the vehicles (:45)
- Re-integrate the balloon to fix the pixellated rope problem (1)
- Address the efficiency of coding and practices to avoid the current lag problem (4) Harry
- Address the alternate control functionality necessary to be applicable to touch screens (5) Harry

- Clean up and comment code (3)

Jon: Vehicle Graphics

- 1 – Address the look of the point and clock displays (2)
- 1 – Add Aaron's big lightning bolt to the side of the leaf (:30)
- 2 – Add people silhouettes inside of cars (1)
- 3 – Add animation to show cars kicking up rocks (2)
- Help Aaron and/or work on the group tasks

Joe: Music, Sound Effects, and Pollution

- 1 – The old man coughing (:30)
- 1 – Ensure all stub sounds have been replaced
- 1 – Rocking chair sound effect (:30)
- 1 – Refined smog animation (3)
- 1 – Minor tweaks here and there regarding instrumentation, notes, and song structure. (1-4)
    - Consistent levels
    - Music following theory (C major means no sharps/flats)
- 2 – Music transitions between various environments, states, and game screens (5-7)
- 2 – Record Jim as the old man and export them all separately (2)
- 2 – Loading screen noises - possible jingle (3)
- 3 – Introductory cinematic music

The Finale

Our Reflection:

Were our goals met?

Our goals were rather lofty in the define section, but the small details that were later omitted and refined did not reduce but rather increased the quality of the game. In terms of the big picture we had defined, we were very successful.
I feel that the group was very successful in meeting the goals that we set out at the beginning of the semester. We worked together well and produced a fully functional flash game. This game works exactly how we wanted to and clearly gets across the message that we intended it to.
I feel we accomplished our overall goal. We definitely convey how pollution is bad for the environment and how it is caused, and this game is very fun to play as well.

What challenges did you have to overcome as a team?

The initial challenge we faced as a team was time commitment. We often found it hard to balance IM 313 with other classes and still produce quality work by the various deadlines. Such time commitment issues even drove one our former group members, our programmer, to drop the course because it was such a heavy burden to bear and balance with his other courses. This, of course, being our programmer who dropped, brought a whole other slew of issues to cope with – who would be the next programmer, how could we now evenly divide the work amongst each other, and even meeting times had to be re-drawn.
Gus stepped up and took over the role of lead programmer for the team and has done a fantastic job while also learning along the way. Schedules were redrawn, and, in the end, it could even be inferred we were better off without our “fallen comrade”.
Another challenge was making sure it was clear to the player the relationship between the cars they remove from the road and what happens afterward. We did this by making each polluting car that the player removes add directly to the building of the windmill. The recycled scrap metal from the polluting car also is used to create new, more eco-friendly, cars to reduce pollution.

Some advice to future teams and upcoming students from your friends at Fast Rocket:

Find out what people are good at really fast, and assign individuals jobs and tasks based on these strengths.

Help your teammates out when they are struggling, and constantly hold everyone accountable for what they were supposed to get done. If you don't hold people accountable for their work, they will come to lack the discipline they need to finish. If you don't help them, and you have free time, you are just as accountable for their failure, and this failure will drag you down.

Never tolerate mediocre work; you should always strive for more.

Always schedule your time wisely. Plan out group meetings so that they are convenient for everyone. Set time aside outside of class or your job for creating the content of your video game. Your game is a project that will require commitment and effort and time is of the essence, so use it wisely.

How will we use what we have learned here in the future?

In the future we will most definitely utilize the four step process – define, design, develop, and deploy, one of these in particular, defining, stand out the most. Taking a lot of time to define is something we have never done before and, after experiencing it through 313, is completely worth it. Defining prevents from designing and developing things that aren't necessary.

Testing is another thing we will most definitely utilize in the future. Getting so wrapped up in something you understand but no one else does is dangerous, and causes developers to become ignorant and, thus, overlook crucial mistakes and causalities for failure. Paper Prototyping, Alpha testing, and Beta testing, are all great, certain ways to avoid such a dilemma.

Making this game also changed our approach to producing projects a lot. It made us realize just how much work and attention to detail needs to be applied to even the smallest things to make an excellent project. It also made clear the importance of have a good definition and scope of what you want to accomplish before you actually start off trying to create things. This allows you to fine tune and refine your idea and also plan and map out exactly what you want your project to be. This lesson is most definitely something we will cherish for the future

In the future we will also certainly spend more time planning. We were surprised as to how much planning went into the game and how important it turned out to be. I will make sure to have people critique my work throughout the project so I can make improvements.