

Functional Specification Document

Solar System - Educational Matching Game

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Introduction

Fun facts about the solar system introduced to elementary school students in the form of a matching card game. The planets and our solar system have a vast array of facts for an elementary school student to learn. To help spur on this process we will take a common memorization technique of using flash cards. Instead of flash cards it will be matching facts with the planets they are associated with.

The purpose is to make the classroom knowledge more concrete for the kids through play. It will be a mechanics-based game, with cards that flip. The facts will be focused around the planets and solar system. It will not venture past this subject matter. The game will have a scoreboard for matches. The game will have different difficulties with the questions becoming more advanced as well as the number of cards increasing in the next levels. I plan to create 3 levels of difficulty. Because this is a matching game, there will not be a losing selection. Clearing the matches off the board will be timed. The time it takes for a player to match all the cards on each level will be tallied in the score. Players will be motivated to get a higher score with faster times and matches.

The game will be similar to the board game “Memory”. It will be different in that the player will not be matching similar looking objects but objects with facts about that object. The other card will be a question. The card, which is mostly graphic based, will also have the written answer to what the player is seeing. An example would be if the card has the sun on it as an image, it would also say sun under it, to insure the player knows that the image is the sun.



Game Play Concept

Card Matching Game



The first thing to happen will be an introduction showing outer space and the solar system. It will have the name of the game and creator. The introduction will have a skip feature. The next screen will be visual based instructions with written instructions on how the game is played.

This game will be played mainly through mouse clicks. The game will record number of matches and how long it takes the player to match all the matches on a level. The time is saved when the player moves to the next level and round of matches.

The cards will flip when clicked, and make a flip noise. Only two cards will be flipped at any given time. Once a match is done those cards are removed from the board.

I am looking at using the single-symbol method to make the cards, because I plan to have a number of cards for the different levels of game play.

The game will have a scoreboard, which I will set up as 100 points for a match and -5 points for a miss. This is quoted in our book as a good start for score. I might change this element. I also want to have a play again button, as well as an end of game score record. So the player can see at the end of the game what score they got and how long it took.

Next to the play again button will be a play next level button. This will advance the player to the next level, or give the player to opportunity to retry the level they just completed.

Gameplay

The game will use the mouse to interact with the cards and all play will be done through mouse clicks. The player selects the cards by clicking them with the mouse. The mouse will make an audio flip noise when a card is selected the card will flip showing the image or question.

Only two cards can be flipped at a time. If the cards flipped are not a match they flip back after a set amount of time if the player doesn't first click another card, or if the player re-clicks the last card flipped.

When the player makes a match the cards make a sound that a match has been made. The game also has a score shown in the upper corner and a clock recording time for each level. The game ends when the player has made all the matches. The game will give an option to advance to the next level or retry the game for a better score.

The end of game screen, which is also an advance to next level screen, in levels one and two will also display the current score and time. The score for each level will be displayed separately for that level. So at the end there will be a set of three scores and times. A score for level one, level two and level three. I might create an overall score of the three levels but not sure.

The name of the level will be posted at the top of the screen. Also the card graphics will be different for each level. I will also have a different colored matte for each level. The color of the matte will accent the graphic side of each card. The audio will be an interactive element created when the mouse is clicked. The mouse clicks will select cards; restart the game and flip cards back over even after they are picked.

Meaning that if a first card is picked and the player wants to undo the choice for another card, the player can do so. I might make this a penalty as if it is a bad match. The game will have a return to main menu button to restart the game at any time. The game will be able to be paused with a pause button up near the clock. The player will know the game is paused because the clock will stop its count down.

The game will also have a game over screen, which will say "Play Again" and another button to advance to next level, when appropriate. The game over feature will be a screen shown at the very end of all levels.

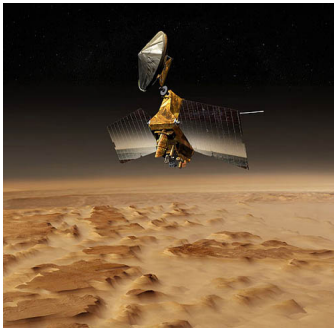
The first level will have 16 cards to match, with a 4 x 4 grid. The size of the screen will be 1024 x 768 screen size. The screen sizes will stay the same throughout the three levels. The first level will be matching simple planets to images. This will be basic questions, and simple concepts. The next level will be a 4 x 4 grid but the questions will be more advanced. The answers will be images of planets with the planet names.

User Interface Design

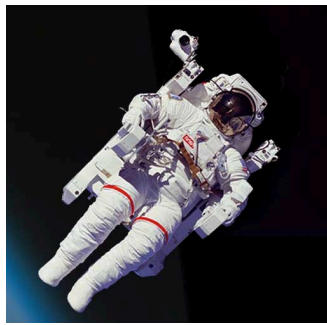
Game art, video, and audio.

Graphics

Assets - Back of Cards



Level One



Level Two



Level Three

Assets - Matching Example



Saturn

**What Planet is the
second largest
planet?**

**Hint:
Only Jupiter is
larger.**

User Interface Designs

Audio

The game will have audio in the form of buttons and click noises. There will also be a click noise for when a match is made, which I want to sound like a chime. The other sound will be that of a card being flipped, this will activate when a card is clicked. If the player doesn't pick a matching set there is a muted noise as the cards flip back over showing the common back. I don't want this non-match noise to be too discouraging so it is a light sound.

Sounds for Game

<http://www.freesound.org>

Miss Sound, First Card Sound and Match Sounds

All sounds from freesound.org and manipulated to suit in adobe auditions CS6



Interface Design

The first interface experience will be the introduction. The introduction will play and have an option to skip. The introduction is an image of the solar system with the planet earth spinning into its place in the line up of planets.

The frame pauses with the option to continue to game. Using the mouse button the player can click the button that opens up the matching game. There will be an option to see instructions on how the game is played. This will open on the right side of the matching game.

The game will use the mouse to interact with the cards and all interactions will be done through mouse clicks. The player selects the cards by clicking them with the mouse. The mouse will make an audio flip noise when a card is selected the card will flip showing the image or question. Only two cards can be flipped at a time. If the cards flipped are not a match they flip back after a set amount of time if the player doesn't first click another card, or if the player re-clicks the last card flipped.

When the player makes a match the cards make a sound that a match has been made. The game also has a score shown in the upper corner and a clock recording time for each level. The game ends when the player has made all the matches. The game will give an option to advance to the next level or retry the game for a better score.

The end of game screen, which is also an advance to next level screen. I had to change this up in that the scores will not be recorded or saved throughout game play. The button takes you to the next level without a score option.

The first level of the game will have options for instructions on how to play the game. This information will be in a side button that says instructions. When this is clicked it opens up a page that shows instructions for playing the game. Clicking instructions again closes the page that holds this information on instructions.

Card graphics will be different for each level and each level will have a different images on the background. This was a suggestion in testing and comments to change the background to an image. The audio will be an interactive element created when the mouse is clicked. The player will use the mouse to select cards; restart the game and flip cards back over.

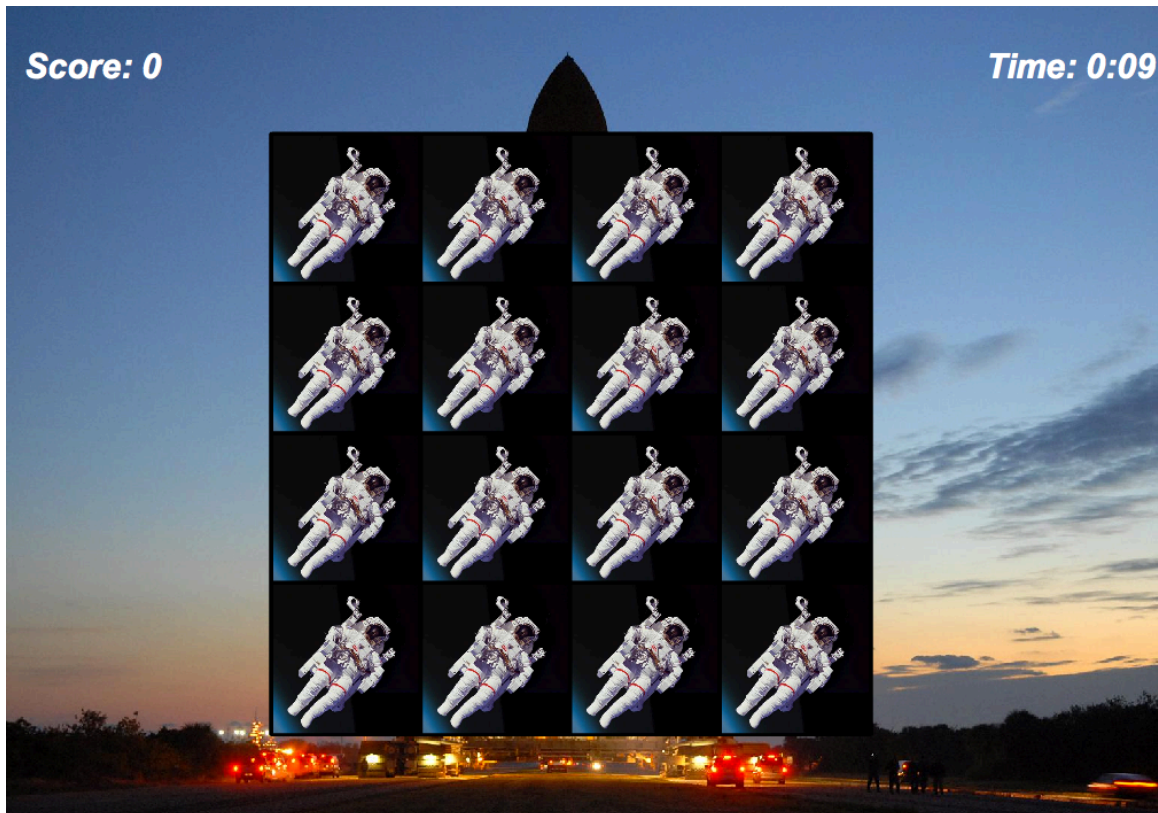
User Interface Design - Level I

The first level will have 16 cards to match, with a 4 x 4 grid. The size of the screen will be, 1025 x 786 pixels,



User Interface Design - Level II

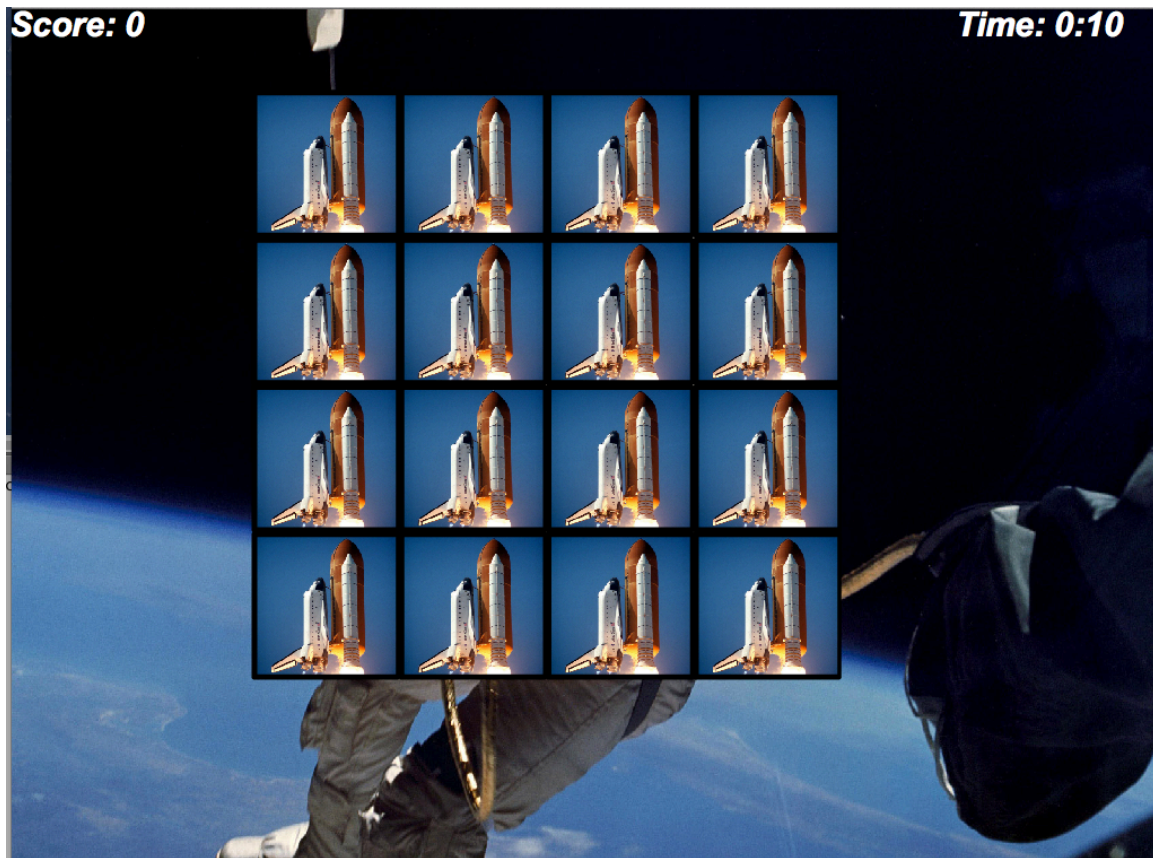
The second level will have a 4 x 4 grid but the matches will be more complex than the first level. Which will be very basic in nature.



User Interface Design - Level III

~~The last level will be the most advanced with a 5 x 5 grid. Testing this left a single card and broke my game because 25 is not an even number. This is a 4 x 4 grid. It will have difficult questions. It will have the pause button like the other levels. No reason to pause~~

After this level will be the end of game scene. This scene will have the option to play again and show a final score.



Game Mechanics

The game will be created in Adobe flash it will ActionScript 3.0. The game will be mechanics-based with levels becoming increasingly difficult. There is no storyline in this type of format. The game will operate through the use of mouse click functionality.

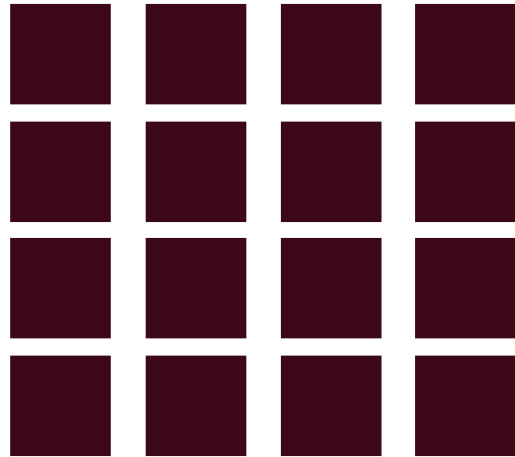
Each level of game play will be done in separate scenes. The scenes will be an option of play for each level in sequence. The game will have an introduction with a skip feature built in.

The game will have a pause button for the clock and it will also have reset button that restarts the game.

All play will be done through the mouse and the player will match images to questions. The set up of images will be done in a single symbol for each level. The single symbol will hold the graphic on one side and the different cards on the other.

The game will use external action script files, as well as arrays to shuffle the cards.

I plan to use mp4 audio in the library for most of the sounds, which will be short tones. The tones will be uploaded with the site.



With review of my mechanics the best grid for the level one will be like the one above as a 4 x 4 grid. Level two will be a 4 x 4 grid with more complex questions, ~~and level 3 will be a 5 x 5~~ with the most advance questions and some easy ones mixed in.

Game CHANGES



The above is how I envisioned the game. I found that it was difficult to set up all of the coding features with pause and reset on the same frame that is playing the game. Also I could not find a way to get the score to carry from game to game and make a final total.

What I did was mute down the significance of the score and the time. The instructions are on the main page and in a separate frame. The pause button was not necessary because there is not a record or emphasis on the time. The reset button is a feature that is set up at the end of the rounds and is now double featured. You can redo the level you just completed or move to the next level. I liked this addition. I also got rid of the header aspect because of the window size and made the cards larger so font was easier to read.

Game Diagram - Levels

