

CS19929 Creating Computer Games for Learning

Project Milestone #3 - Final Game Design

This document is similar to your basic game design document (Milestone #2) with two major changes.

- First, you need to write this as a single, cohesive document, not as if you pieced together three entirely separate assignments.
- Second, several more elements need to be added based on topics we covered in lectures after your basic game design document was due.

As with the basic game design, the purpose of this milestone is to **describe the game well** and **describe how your knowledge of the elements of game design in this course were used to influence the design of your game**. Most answers, especially those in the middle, should be several paragraphs, not just a few sentences. All ideas should be well beyond the brainstorming phase and into the design phase, at a point where, if we had the time, we would implement it. So make sure you are not just tossing ideas out for each of these elements – you are fully describing what you *would want to implement*.*

Below are the required sections of this document.

ABSTRACT:

Describe the learning goals of your game, the premise, and the overall game design in just a couple paragraphs.

Describe the area, general age group, and skills you are going to teach your users. Make sure that these are skills, not just content. These need to be specific - not just "math" or "memorization" – exactly which math skills are expected or exactly what level of memorization is expected to be built? You also need the skills to show some range from easier to harder.

LEARNING TRAJECTORY: Create a hypothetical learning trajectory for how student skills / knowledge will be built. The left edge should be the skills you assume students start with (i.e., lower anchor points). The right edge are the most advanced skills you will teach (i.e., upper anchor points). If there are concrete skills in the middle, you can highlight those with a different color. If you think it is more appropriate to split this into multiple trajectories, you can do so. Where available, cite sources for either the learning goals themselves or the relationships between learning goals. Much of what you are teaching has research behind it, so you should not be making all of it up.

GAME DESIGN: Describe your game, taking care to describe the different elements such as premise, rules, etc. This needs to be a *complete* description that will allow the readers to understand the gameplay.

SKILL BUILDING: Describe how the game gets more challenging as users learn skills, using vocabulary from game design.

USER-CENTERED DESIGN: Include the three mythical user profiles. Explain how you took into account the limitations in skills of each user to influence your game design.

INCLUSIVE DESIGN:

Describe what elements you included to engage the player, again using vocabulary from game design. Describe how different “player types” will find something that engages them in your game.

Describe how you would incorporate universal design for learning (UDL) to accommodate students with sight impairments, hearing impairments, and/or cognitive impairments?

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Project Milestone #3 - MVP Description

The MVP description is part of Milestone #3 (due on Monday, July 20). You need to submit your MVP description for approval before implementing your game. The implementation is due on the last day of class (Thursday, July 23). You may do either 2-D or 3-D. There is absolutely no requirement that your game be 3-D, and I have no preference for 3-D.

This MVP description will be treated as the “contract” between you and the instructor for the grading of your project implementation. You need to include the following details:

- The landing page or outer world of your game that shows what the overall game play is like. If you have a large world like [Zelda](#), then you just need to make a small part of the world – enough for someone to understand what is going on and really illustrate the premise and feel of navigating your game.
- Necessary elements for game play like scores, health, etc. Describe what aspects you will include.
- Three levels or three minigames –
 - elementary level (potentially tutorial). The purpose of this is to illustrate how you are going to teach an initial concept and the game mechanics
 - intermediate level (level n), spread out from the elementary level. This shows what your more advanced play will be like, and how it will teach a more advanced concept.
 - intermediate level (level $n+1$), the level just after the last one (level n). This shows how you *gradually* increase difficulty in your levels. This needs to be at a very similar level to the previous one and not introduce an entirely new mechanic or topic. I want to see how two different levels treat the same subject with different levels of difficulty.

Note on levels: Take care about the definition of “level”. A level in a video game requires several actions, not just one, all at approximately the same difficulty. For example, in our Qupcakery game (quander.cs.uchicago.edu), one level of the game introduces a new quantum gate and/or is designed for a specific level of difficulty with the newest gate and possibly other gates. A single level consists of about 10 groups of customers coming to get qupcakes. This means they need to solve about 10 quantum challenges for each level. The three levels cannot be three completely disconnected topics or experiences, introducing three completely separate things – I need to see how you build difficulty gradually. For example, you may introduce something in one level, giving them 10 or so chances to engage with it. Then you have a next level that combines that new thing with something already in the game, making them choose between the two or combine the two. This depends a bit on what your game is like. This could be two different minigames instead of three, with one showing two sequential levels and the other being different. So look at your game and see what makes sense compared to the goals of this requirement.

Since each of you have different projects, we will need to evaluate each project differently. The purpose of this MVP description is to provide more details on what you will implement in your MVP. You and I will review this to adjust for difficulty based on your game idea and the platform you are using to develop your game. To help you write this MVP description, I have included an example below.

Short Game Description Make Humans Angry Again is a puzzle game where you will travel back in time to stop the destruction of the world. You can manipulate spacetime so you use gravity assist to travel through the multiverse to get to our universe. Your job is to arrange the stars, planets, moons, and asteroids in each universe so you can use their gravities to reach the wormhole and get to the next universe.

MVP Specs Elements of the game and their functionality: The spaceship orbits around the stars, planets, moons, and asteroids. The spaceship has a health bar. Stars, planets and asteroids have different gravities because they have different masses. The grader should be able to tell that stars have a stronger pull than planets, etc. Colliding with stars kills the spaceship. Colliding with planets, moons and asteroids make you lose health points; colliding into more massive objects costs more health points. Colliding with a wormhole brings you to the next level. You can move the space objects within certain boundaries.

Settings: There will be an intro splash page, a main page with level numbers, and the backdrop for each level. To go into the level, click on the level number. Only three level numbers will be active. Level definition: A level consists of three challenges at the same level of difficulty, with the same number of stars and planets. Once the ship gets to the intended position on one screen, it moves to the next screen of similar difficulty, until it completes all three screens.

Level descriptions: 3 universes/levels - one introductory level and two intermediate levels:

- Level 1: 1 star and 1 planet so the players learn that stars are lethal and planets just cost you points. Stars also have a stronger pull than planets.
- Level 12: 1 star, 2 planets, and 4 moons so players learn that moons cost fewer health points than planets and have a lower gravity.
- Level 13: 1 star, 2 planets, 2 moons, and 1 asteroid. This has similar difficulty to level 12, but the asteroid introduces an additional gravity wrinkle.