



GAME DESIGN DOCUMENT

SUPPLEMENTARY LESSON

Summary

Plan a brand new game and build it with the CS skills learned so far! For communication practice, students can trade Game Design Documents and build one another's games.			
CS Topics: Any of the following: loops, logic, math, variables, line navigation		Learning Outcomes: Design games and maps, create specs, learn game design industry practices.	
Grades: ANY	Coding Level: ANY	Map Style: ANY	Game Mechanic: ANY

Introduction

This lesson walks through how to design and plan making a game for Ozobot with code. Use this lesson after completing any number of lessons from Ozobot's [Elementary Computer Science with Game Design!](#) To learn more about this series of lessons, visit the [Elementary Computer Science, with Game Design README](#).

In the gaming industry, game designers write out the specifications a new game should have in a document called a Game Design Document, then give that to the engineers to build the game. A GDD can be a page or two to novel-length. It breaks down exactly how a player's character can move, win, lose, get points, and any other behavior that adds to the fun or functioning of the game.

For an Ozobot game, students will plan out the program's game mechanics (how it will win, lose and move) and its map. This is an opportunity for students to build a program from scratch. If students aren't ready to plan from scratch, they can access any previous example program. There currently is no way to copy and paste parts of a program into another window. Students are encouraged to copy parts of a program by putting blocks together from scratch, which helps to see how and why code is written the way it is.

To begin this lesson you will introduce the idea of Game Design Documents and how they're used in the game design industry (for details, see: https://en.wikipedia.org/wiki/Game_design_document). Next, students will decide what they want to build (if they haven't already). Students can research arcade games, popular app games, or sports. Students can also just bring together game mechanics and map characteristics to see what will happen. After the program and map are built, students can ask each other to play their games.

Questions or comments about this lesson? We'd love to hear from you! Email us at ozoedu@ozobot.com

SETUP

REQUIRED MATERIALS

- 1 Bit or Evo per group,
- 1 printed Game Design Document per group (attached),
- 1 computer or tablet with wifi per group,
- Extra paper to make notes and the game's map,
- Ozobot markers, or other markers in red, green and blue (chisel-tip and pastel green and blue)

STUDENT GROUPING

- Groups of 2-3 students are recommended, but 1:1 student to robot ratio is fine.

RESOURCES

- **About Game Design Documents:** https://en.wikipedia.org/wiki/Game_design_document
- **Classic arcade games:** https://en.wikipedia.org/wiki/Golden_age_of_arcade_video_games (click individual games' titles to see their 'Game Play' sections.)
- **Popular app games:** (From kids' minds! Whatever kids are into.)
- **OzoBlockly Examples:** See the examples in each Mode of Ozoblockly

ELEMENTARY CS LESSONS' PROGRAMS

- 1 Color Search: ozo.bot/color-search
- 2 Line-End Search: ozo.bot/line-end-game
- 3 Danger Zones: ozo.bot/danger-zones
- 4 Team Color Search: ozo.bot/team-color-search

TIME MANAGEMENT

- This lesson is planned for 50 minutes. See the LESSON OUTLINE headers for a breakdown.
- Designing a game can take a lot of effort; you can turn this class into a 2 lesson class, if time allows.

LESSON OUTLINE

INTRODUCE GAME DESIGN - 10 minutes

1. **Organize** students into pairs or groups.
2. **Explain** today's lesson to your students: Each group will design and create their own game for Ozobot. Use your creativity and what you learned from the previous lesson(s) to design and code it.
3. **Explain** that game designers plan a game by deciding how the player can win and lose, how they get points, and how they will move around the map. Groups will plan a game based on the GDD document, but should put their first ideas on scratch paper before filling out the GDD itself.
4. **Optional:** Put students into different roles. These are: project manager, who keeps time for whole lesson(s), breaks ties, and manages the other two's work; the map designer, who draws the map and plans 3D objects; and the engineer, who will code the program. Students can help each other with any task and they will all contribute to the ideas for the game.
5. **Hand out** one Game Design Document, scratch paper and markers to each group.

STUDENTS PLAN THEIR GAME - 15 minutes or 1 class session

1. If students don't have any ideas for their own game yet, show them the resources from SETUP (app games, arcade games, and OzoBlockly examples).
2. Students should plan and write their GDD for ~15 minutes, if the class is only 1 hour. Planning can also be a whole class length, with building the game a second class.

STUDENTS BUILD THEIR GAME – 25 minutes or a second class session

1. Hand out iPads, laptops or other device to access www.ozoblockly.com/editor
2. Students begin coding their program with the desired game mechanics.
 - a. If students need troubleshooting tips, help them open a new tab with the most similar code example (either a previous game lesson or example in the editor).
3. At the same time, the map designer is drawing out the map with any obstacles.
4. Students should test their program as soon as possible, so they can refine and troubleshoot.
5. If there is time, students share their project: the game's title, how to play, how to lose, and any other attributes and any specific inspiration.
6. When done, students should save their program by clicking the save folder icon at the bottom of the editor, choose the link option, and write down or bookmark the URL.

Map Design

Include the size measurements (dimensions), color placement and any 3D obstacles

First Draft

Second Draft