

LEARNING GOAL & SCALE: Standard

4	Student will be successful in level 3 and: Add advanced elements of puzzle design to their game.
3	Student will: <i>Explore elements of puzzle design.</i> -Describe the essential elements of a puzzle. -Identify the different types of puzzles. -Describe the basic principles of high-level puzzle design. -Describe the basic principles of low-level puzzle design. (Standard 32.0)
2	Student will: Define what a puzzle game is.
1	With help from the teacher, the student has partial success with the current content.
0	Even with help, the student has no success with the current content.

Puzzle Design

This week you will learn about puzzle design by creating a game in GameMaker or unity (your choice but I recommend GameMaker if you have not created a game in another engine yet). **Simply put puzzle games are games where the player solves a puzzle(s) to progress through the game.**

First: Choose what type of puzzle game you will create ([Click Here view the different types of puzzle games there are](#)).

Second: Complete a very simple design document to start your game. The design document will include a description, game objects, sounds (if applicable), controls, gameflow, and levels. [Click Here to see a basic game document to assist you.](#)

Third: Find (or create) assets you want to use based on what your theme is and the type of game you will do. Remember you may have to adjust the size of your assets in Photoshop (image—Image size—check or uncheck restrained properties as needed). Backgrounds are 1024x768 unless you change the default room size. **Use this link to find GameMaker specific assets:**
<http://sandbox.yoyogames.com/make/resources>

Fourth: Follow the tutorials OR do it on your own if a tutorial is not needed. Don't for to create a sprite (spr_) for every image except backgrounds, and create an object (obj_) for each item you created sprites for. Tutorials are on the next page depending on the puzzle type you chose. **You do not have to follow a tutorial; you can do your unique puzzle game but if you do it must follow the aspects of the type of puzzle game you are doing.**

Choose a type of puzzle to base your game on:

Environmental Puzzles: These are the puzzles that require the player to make use of his surroundings. The player enters a new room or area, and is greeted by a challenge. More importantly, the area contains the tools that the player needs in order to solve that challenge. The simplest example of an environmental puzzle is a maze—the environment itself becomes the puzzle.

Want to do a maze? Check out these tutorials:

Tutorial 1: <https://www.youtube.com/watch?v=8JHUdvQmEXY>

Tutorial 2: <https://www.youtube.com/watch?v=OcYW28Nnrdg>

Tutorial 3: <https://www.youtube.com/watch?v=oXJyrREzY70>

Tutorial 4: <https://www.youtube.com/watch?v=4WK6Ym46DJo>

Tutorial 5: https://www.youtube.com/watch?v=FG9_WtpG_HE

Inventory Puzzles: inventory puzzles require a player to bring items into a challenge. In order to progress, the player must have acquired an item that allows him to complete the puzzle. While these items can come from the current area, often the best inventory puzzles force the player to think back on his journey and dig through his pockets for the perfect answer.

Check out this tutorial if you want to create an inventory puzzle game: ***You can do the below tutorial if with your own assets and background colors; be creative and don't do it identical to the tutorial.***

Box Puzzle Tutorial 1: <https://www.youtube.com/watch?v=AZqaCHEia7A>

Box Puzzle Tutorial 2: <https://www.youtube.com/watch?v=lkqVKs5OB-s>

Box Puzzle Tutorial 3: <https://www.youtube.com/watch?v=PTOQTsgE8Hs>

Box Puzzle Tutorial 4: <https://www.youtube.com/watch?v=nhb80t82-9c>

Box Puzzle Tutorial 5: <https://www.youtube.com/watch?v=ORg18P5cGFg>

Mechanic puzzle: On some level, every puzzle is a mechanic puzzle. I'm talking about unique mechanics that aren't found in every game, but are specific to yours. In order to solve a mechanic puzzle, the player must utilize one or more game mechanics to manipulate puzzle elements. An example is an RPG game with a puzzle(s) within it. Another example includes matching games (called Match3) like bejeweled.

RPG Tutorial part 1 (you will need to add the puzzle within this game on your own): <https://www.youtube.com/watch?v=WB2alpO62GM>

RPG Tutorial Part 2: <https://www.youtube.com/watch?v=nFqr8d9Qq0I>

Match 3 Tutorial (Games like bejeweled, Dr. Mario, Candy Crush, etc.):

Match3 Tutorial 1 (like bejeweled): <https://www.youtube.com/watch?v=-mu3PQqbQBM>

Match3 Tutorial 2: <https://www.youtube.com/watch?v=AMl8l0jjglo>

Match3 Tutorial 3: <https://www.youtube.com/watch?v=XFDLBEelMvc>

Match3 Tutorial 4: <https://www.youtube.com/watch?v=dbDdprBt1Zk>

Match3 Tutorial 5: <https://www.youtube.com/watch?v=9W5oN6K4l64>

Match3 Tutorial 6: <https://www.youtube.com/watch?v=cZ2JGEgxURE>

Other helpful tutorials that you can use to spruce up any type of puzzle game:

Create a Menu Screen: <https://www.youtube.com/watch?v=L0NJHQ27qHo>

Health, lives, and Scores: <https://www.youtube.com/watch?v=5Pq4TCyYHtc>

Scores and Coins: <https://www.youtube.com/watch?v=Dx316LsOkfw>

Basic Projectiles:

https://www.youtube.com/watch?v=ehqGwY01roU&index=5&list=PLPRT_JORnIurFYwHdWhLWR3bLH2nzChsm

Alarms: <https://www.youtube.com/watch?v=li4n6HTkUcw>

Enemy AI:

https://www.youtube.com/watch?v=aNd_JotUOXE&index=33&list=PLPRT_JORnIurFYwHdWhLWR3bLH2nzChsm

Fade in/Fade out:

https://www.youtube.com/watch?v=ySpWZfcwwSQ&index=28&list=PLPRT_JORnIurFYwHdWhLWR3bLH2nzChsm

Inventory: <https://www.youtube.com/watch?v=LwBC6kyTa0M>

Add Gamepad/Controller Controls:

https://www.youtube.com/watch?v=z1Gp1GZJm00&list=PLPRT_JORnIurFYwHdWhLWR3bLH2nzChsm&index=31

Basic Game Design Document (should not be detailed like the group project one):

1945 design document

Description

In this game you control a plane flying over a sea. You encounter an increasing number of enemy planes that try to destroy you. You should avoid these or shoot them. The goal is to stay alive as long as you can and to destroy as many enemy planes as you can.

Game objects

The background is formed by a scrolling sea with some islands. The player's plane flies over this sea. You can shoot bullets that destroy enemy planes. There are four types of enemy planes: a plane that you encounter and should be destroyed, a plane that fires bullets downwards, a plane that fires bullets towards the player's plane, and a fast enemy plane that comes from behind rather than from the front.

Sounds

There are some explosion sounds and there is some background music.

Controls

The player controls the game with the arrow keys. With the space key you fire a bullet. Only one bullet can be fired every five steps.

Game flow

The player immediately jumps into the game. The player has three lives. When all lives are gone a high-score table is shown. Pressing the <F1> (help) key will give a brief explanation. Pressing the <Esc> key will end the game.

Levels

There is just one level, but more and more enemy planes will arrive: first only the easy type but later the more difficult types.

Want to learn more about puzzles and puzzle design? Check out the below links to dive deeper.

<http://devmag.org.za/2011/04/16/how-are-puzzle-games-designed-introduction/>

<https://vungle.com/blog/2015/04/27/the-6-rules-of-a-hit-puzzle-game/>

<http://threeonezero.com/development-progress-puzzle-design-and-iteration/>