

Mechanics of Game Design (Syllabus)		
Unit One: Introduction to Game Design		
Essential Questions	• Why Study Game Design? • Why does Game Design Matter? • What is fun? • What makes something fun, or not fun? • What are “Play Values”? • What is a Game Mechanic? • Who is your audience and how do they affect your play values?	
Standards	Digital Literacy and Computer Science • 9-12.CT.d.10 Use an iterative design process, including learning from making mistakes, to gain a better understanding of the problem domain.	
Concepts and Skills	• Discussion: ◦ What is Game Design? ◦ What is a Game Mechanic? ◦ What makes something fun? • The Design Process ◦ Overview/Review ◦ Iterative Design • Designing a Group/Classroom Game ◦ Research: Play, analyze and discuss existing games ◦ Refine the Problem: Identify your audience(s) and the elements that would make a game most appeal to them ◦ Brainstorm: Generate and refine ideas for a new game ◦ Design: Refine one of your ideas ◦ Test: Test your game idea on the class, discuss what does and doesn't work and how it could be approved ◦ Redesign: Make changes to the game on the fly based on class feedback and then try it again. ◦ Continue Iterating until happy with the game play	Science and Technology/Engineering Practices • Practice 1. Asking Questions and Defining Problems
Content Objectives	I can explain the steps of the design process. I can explain how an interactive design process is beneficial to the game design	

"I can Statements"	process I can give example of various game mechanics I can explain how a game's play values might differ depending on its target audience I can identify the play values of my target audience I can evaluate a game play experience based on my understanding of the target audience I can brainstorm ideas I can design a game that requires no physical pieces I can utilize an iterative process to continuously tweak my game based on feedback from my classmates
Assessments, vocabulary, products, practice	• Assignment: Design a Classroom Game
Text, Materials, and Resources	• Article: Excerpt from Eric Zimmerman: How I teach Game Design • Book: Games, Design and Play: A Detailed Approach to Iterative Game • Book: Design, Game Design
Unit Two: Board Game Design	
Essential Questions	• How does a game designer experience a game? • How do you utilize game mechanics? • What is a paper prototype • How do you playtest a game? • How do you create physical pieces, cards, boards etc
Standards	Science and Technology/Engineering • HS-ETS2-1(MA). Determine the best application of manufacturing processes to create parts of desired shape, size, and finish based on available resources and safety. Digital Literacy and Computer Science • 9-12.CT.d.10 Use an iterative design process, including learning from making mistakes, to gain a better understanding of the problem domain. • 9-12.CS.a.4 Explain and demonstrate how specialized computing devices can be used for problem solving, decision-making and creativity in all subject areas. • 9-12.CT.e.1 Create models and simulations to help formulate, test, and refine hypotheses • 9-12.DTC.a.1 Use digital tools to design and develop a significant digital artifact

Concepts and Skills	• Discussion: Experiencing games as a designer • Introduction to creating paper prototypes • Review of 3D model making methods • Designing a Board Game ◦ Research: Play, analyze and discuss existing games ◦ Refine the Problem: Identify your audience(s) and the elements that would make a game most appeal to them ◦ Brainstorm: Generate and refine ideas for a new game ◦ Design: Refine one of your ideas ◦ Build: Make a paper prototype of your board game ◦ Test: Test your game idea on the class, discuss what does and doesn't work and how it could be approved ◦ Redesign: Make changes to the game based on class feedback and then try it again. ◦ Continue Iterating until happy with the game play ◦ Execute: create a final version of the physical components necessary for your design	Science and Technology/Engineering Practices • Practice 1. Asking Questions and Defining Problems • Practice 2. Developing and Using Models • Practice 6. Constructing Explanations and Designing Solutions
Content Objectives "I can Statements"	I can evaluate a game play experience based on my understanding of the target audience I can brainstorm ideas I can design a game that requires physical pieces I can utilize an iterative process to continuously tweak my game based on feedback from my classmates I can create physical pieces (board, cards, tokens, etc)	
Assessments, vocabulary, products, practice	• Activity: Tic-Tac-Toe Exercise • Assignment: Swapped Game • Assignment: Design a Board Game	
Text, Materials,	• Video: How to Experience Games as a Designer	

and Resources		
Unit Three: Puzzle Design		
Essential Questions	• What is a puzzle? • What is a puzzle hunt? • How to solve a puzzle? • Why do people participate in them? • What do you need to know to participate in a puzzle hunt? • What are encoding methods? • What is an extraction? • What is cryptography? • What makes a puzzle hunt different from an Escape Room? • How do you write a puzzle? • How do you test-solve a puzzle?	
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Concepts and Skills	• Discussion of what a puzzle and a puzzle hunt is • Discussion of why people solve puzzles • Discussion of encoding methods • Discussion of extraction methods • Introduction to cryptography • Designing a Puzzle ○ Research: Solve, analyze and discuss existing puzzles. Learn about encoding methods, extraction methods, and cryptography ○ Refine the Problem: Identify your audience(s) and the elements that would make a puzzle most appeal to them ○ Brainstorm: Generate and refine ideas for a puzzle	Science and Technology/Engineering Practices • Practice 2. Developing and Using Models • Practice 6. Constructing Explanations and Designing Solutions

	○ Design: Refine one of your ideas ○ Test: Test your puzzle on your classmates, observe where they got frustrated or ran into problems ○ Redesign: Determine how your puzzle could be improved based on class feedback and then try it again. ○ Continue Iterating until happy with the puzzle	
Content Objectives "I can Statements"	I can explain what an encoding method is I can use basic encoding methods to encode and decode text I can explain what cryptography is I can explain the role of Bletchley park in decoding transmissions during WWII I can explain what extraction methods are I can utilize a variety of tools to solve basic puzzles I can evaluate a puzzle based on my understanding of the target audience I can brainstorm ideas I can design a puzzle I can utilize an iterative process to continuously tweak my puzzle based on feedback from my classmates	
Assessment s, vocabulary, products, practice	● Activity: Sample Puzzle Game ● Activity: Enigmap Digital Room Escape Games ● Activity: Rescue Mr E ● Assignment: Design a Puzzle	
Text, Materials, and Resources	● Video: Mr E's Empire ● Video: Tangram: Advert ● Presentation: Basic Encodings ● Video: The Science of Codes: Intro to Cryptography ● Virtual Field Trip: Code Breakers: Secret War ● Virtual Field trip: Bletchley Park and its connections to today's cyber security ● Article: Extraction Distractions ● Article: Reflecting on Playtesting and Puzzledorf ● Article: Puzzle Testing Process ● Book: Puzzlecraft ● Book: The Do-It-Yourself Escape Room Book ● Book: Introduction to Writing Good Puzzle Hunt Puzzles	
Unit Four: Designing Physical Puzzles/Escape Rooms		
Essential	● What is an escape room?	

Questions	• What makes a physical puzzle different from a paper puzzle? • How do I create a physical puzzle? • How do I test a physical puzzle?		
Standards	Science and Technology/Engineering • HS-ETS2-1(MA). Determine the best application of manufacturing processes to create parts of desired shape, size, and finish based on available resources and safety. Digital Literacy and Computer Science • 9-12.CT.d.10 Use an iterative design process, including learning from making mistakes, to gain a better understanding of the problem domain. • 9-12.CS.a.4 Explain and demonstrate how specialized computing devices can be used for problem solving, decision-making and creativity in all subject areas. • 9-12.CT.e.1 Create models and simulations to help formulate, test, and refine hypotheses • 9-12.DTC.a.1 Use digital tools to design and develop a significant digital artifact Mathematics • G-MG A.1. Use geometric shapes, their measures, and their properties to describe objects • G-MG A.3. Apply geometric methods to solve design problems		
Concepts and Skills	<table border="1"> <tr> <td data-bbox="289 1018 1003 1883"> • Discussion of what an escape room is, and why people enjoy playing them • Discussion of physical puzzles • Exploration of existing physical puzzles • Designing a Physical Puzzle ○ Research: Solve, analyze and discuss existing physical puzzles and how they are different from more traditional paper puzzles ○ Refine the Problem: Identify your audience(s) and the elements that would make a physical puzzle appeal to them ○ Brainstorm: Generate and refine ideas for physical puzzles ○ Design: Refine one of your ideas ○ Build: Create a prototype of your physical puzzle ○ Test: Test your physical puzzle on your classmates, observe where they got frustrated or ran into problems ○ Redesign: Determine how your </td><td data-bbox="1003 1018 1526 1883"> Science and Technology/Engineering Practices • Practice 1. Asking Questions and Defining Problems • Practice 2. Developing and Using Models • Practice 6. Constructing Explanations and Designing Solutions </td></tr> </table>	• Discussion of what an escape room is, and why people enjoy playing them • Discussion of physical puzzles • Exploration of existing physical puzzles • Designing a Physical Puzzle ○ Research: Solve, analyze and discuss existing physical puzzles and how they are different from more traditional paper puzzles ○ Refine the Problem: Identify your audience(s) and the elements that would make a physical puzzle appeal to them ○ Brainstorm: Generate and refine ideas for physical puzzles ○ Design: Refine one of your ideas ○ Build: Create a prototype of your physical puzzle ○ Test: Test your physical puzzle on your classmates, observe where they got frustrated or ran into problems ○ Redesign: Determine how your	Science and Technology/Engineering Practices • Practice 1. Asking Questions and Defining Problems • Practice 2. Developing and Using Models • Practice 6. Constructing Explanations and Designing Solutions
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	puzzle could be improved based on class feedback and then edit your design ○ Continue Iterating until happy with the physical puzzle	
Content Objectives "I can Statements"	I can explain how a physical puzzle differs from a more traditional "paper" puzzle I can solve a variety of different physical puzzles I can evaluate a physical puzzle based on my understanding of the target audience I can brainstorm ideas I can design a physical puzzle I can utilize an iterative process to continuously tweak my puzzle based on feedback from my classmates I can create a working model of my design idea	
Assessments, vocabulary, products, practice	● Assignment: Design and build a physical puzzle	
Text, Materials, and Resources	● Video: The Holy Grail of Puzzle Design ● Video: Behind the Scenes at a World Class Escape Room ● Video: Making a Puzzle Box ● Video: Making an Escape Room Puzzle ● Field Trip: Boxaroo (arrange behind the scenes tech tour) ● Video: How to Make an Escape Room	