



Game Design



Merit Badge Presentation by Robert Casto





Instructor / Presenter



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Prepared. For Life.™



Participation and Content

- **Everyone is expected to participate**
- **Don't be afraid to ask questions**
- **Attitude determines altitude**
- **Be prepared to experiment!**



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Prerequisites & Game Limits

PREREQUISITES

1, 2, 3, 4, and 8 will be covered in class. No preparation needed.

Game Design Notebook - Contains work for requirements 5, 6, and 7. Use something where the pages cannot fall out such as a legal pad or spiral notebook.

5 - Submit game idea by email and receive approval. Once you have approval, design the game writing everything in the notebook.

6 - Play your game with family, friends, and anyone else you wish. The more times you play the better. A minimum of 3 plays should be documented in the notebook.

7 - We will split up into groups and play each other's games. Once the blind test is done, we will provide feedback and then discuss what was learned. All of this must be recorded in your notebook.

GAME LIMITS

Do not require more than 5 players.

Do not over complicate. We have to learn how to play it in a reasonable amount of time.

Games that run long will be stopped early to fit time constraints.

Age range is 11 to 17 so physical games should remember to be safe and fair.

When in doubt, ask. Email me questions so you know.





Requirement 1

Do the following:

- a) Analyze four games you have played, each from a different medium. Identify the medium, player format, objectives, rules, resources, and theme (if relevant). Discuss with your counselor the play experience, what you enjoy in each game, and what you dislike. Make a chart to compare and contrast the games.**
- b) Describe four types of play value and provide an example of a game built around each concept. Discuss with your counselor other reasons people play games.**



Requirement

1a

Analyze Four Games

	Mario Cart	Risk	Uno	Soccer
Medium	Video	Board	Card	Physical
Player Format	1-4 players	2-6 teams	2-99	2 teams, 11 players
Objectives	Win race	Control everything	First no cards	Score goals
Rules	Stay on track	Lots of rules	Simple rules	Simple to complex
Controls	Game controller	Round robin	Round robin	Many controls
Resources	Game console & the game	Board, dice, pieces, cards	Cards	Ball, field, goal
Theme	Racing	Domination	None	Sport, competition
Play Time	Choice	2-3 hours	5-20 min	90 min
Sequencing	simultaneous	Clockwise	Clockwise?	simultaneous
Interaction	Voice, avatar	Game pieces	Cards	Plenty
Information	On screen	Voice,	Top card,	Score,



1b

Play Value



Play Value – Why someone chooses to play a certain game

- 1. Novelty**
- 2. Challenge**
- 3. Stimulation**
- 4. Harmony**
- 5. Threat**

Why Do We Play Games? 12:11





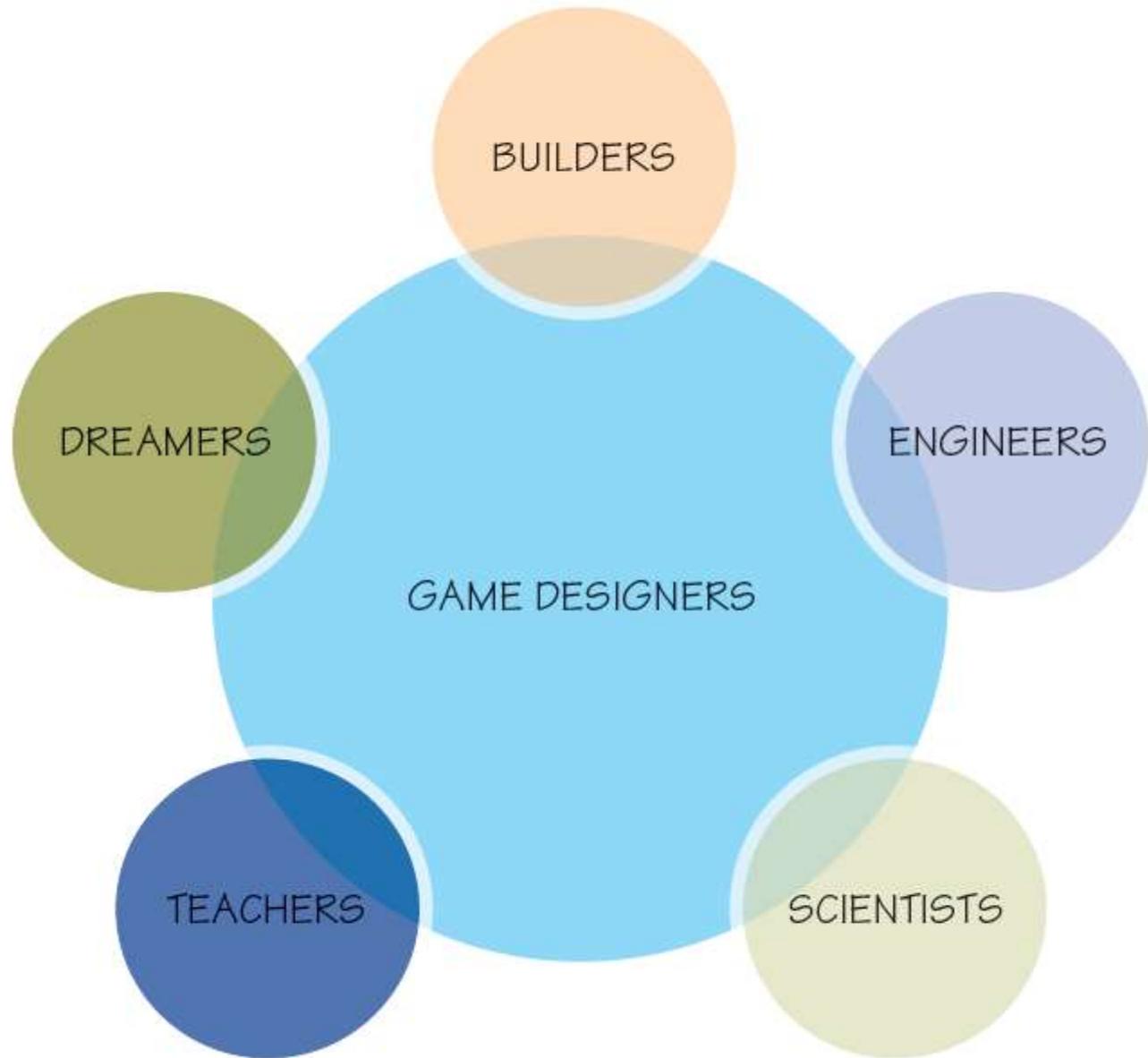
Requirement 2

Discuss with your counselor five of the following 17 game design terms. For each term that you pick, describe how it relates to a specific game.

- **Thematic game elements: story, setting, characters**
- **Game play elements: play sequence, level design, interface design**
- **Game analysis: difficulty, balance, depth, pace, replay value, age appropriateness**
- **Related terms: single-player vs. multiplayer, cooperative vs. competitive, turn-based vs. real-time, strategy vs. reflex vs. chance, abstract vs. thematic**



Game Design Roles



- **Fun**
- **Interactive**
- **Social**
- **Easy to learn**
- **Hard to master**
- **Manageable**
 - Scope and time
- **Well-paced**
- **Immersive**
- **Replay value**
- **Affordable**





- **Background information about the situation**
- **Makes game more realistic**
- **Can provide clues on how to play**
- **Makes the experience richer**
- **Provides a goal**





- **Environment in which the game occurs**
- **Has a big impact on play experience**
- **Can imply certain rules and conditions without having them stated explicitly**





- **Provides way to involve players more deeply**
- **Helps add to realism of the game**
- **Provides opponents and challenges**
- **Player could become the character or have to deal with them**





- **Does everyone play at the same time or take turns?**
- **How are turns taken?**
- **Who goes first, next, etc**
- **When are turns over?**
- **What should be done during a turn?**
- **How does one loose their turn?**





- **Creating the game space**
- **Different from rules and mechanics**
- **Decides where things are, contents, difficulty, etc**





- **Communication of information between players and the game**
- **Cards, screen, buttons, dice, etc**
- **The game needs to give information to the users such as status, score, outcome**
- **Players need to give the game information such as their choice or when to do something**
- **Rules need to be communicated**
- **Information to other players based on the move of a player**



- **How hard is it to complete the game objective?**
- **Special skills needed to compete?**
- **Increasing levels to provide a challenge**
- **Reduce amount of time to finish**
- **Simpler or more complex rules**
- **Fewer or more pieces**



- **Describes the relative strength of resources, mechanics, objectives, and starting state**
- **Ideally a balanced game gives an equal chance of winning to all players**
- **Choice of path should not have better or worse options**



- **Ability to find new options and enjoyment playing the game as skill increases**
- **Variety in game play with many options and potential outcomes**
- **Complexity**
 - Number of rules and elements that must be interacted with
 - Does not make a game deep
 - Too many rules make it hard to learn
- **Chess gets great depth from little complexity**



- **Describes the speed of the game**
- **How quickly must players make decisions?**
- **How quickly and often is information given to the player?**
- **Simultaneous and real-time play compared to turn-based?**





- **Value a player receives from playing the game again**
- **Designers can add things such as**
 - choices of characters
 - difficulty levels
 - starting positions
 - maps
 - levels
 - storylines
 - novelty

Requirement

2

Age

Appropriateness

- Like movies and music
- Maturity level can vary
- Level of difficulty due to
 - Size of the field
 - Complexity of the rules
 - Expected athletic ability
 - Background knowledge
 - Capacity to understand concepts





- **Single player games are played alone**
 - Many video games
 - Solitaire
 - Some multi-player games converted to single player
- **Multi player games require 2 or more players**
 - Sports
 - Card games
 - Board games
 - Some computer games



Cooperative
Vs
Competitive

- **Cooperative games require players to work together toward a goal**
 - No need to keep score
 - Team based and goal oriented
- **Competitive games have clearly defined winners and losers**
 - Players compete against each other
 - Goals are clearly defined where each player is to reach them
- **Some games are both**
 - Most team games



- **Turn-based games**
 - Players alternate turns
 - One plays while the other waits
- **Real-time games**
 - Players are all active at the same time
 - Game ends when goal is reached
- **Can be both like baseball**
 - Both teams are active at same time
 - Only one person bats at a time



- **Strategic**
 - Relies on mental abilities
 - Winner out-smarts opponent
- **Reflex**
 - Relies on physical abilities
 - Fastest physically or mentally
 - Ability to quickly assess best move
- **Chance**
 - Randomness of some sort
 - Adds uncertainty to a game
 - Too much of it can frustrate players



- **Thematic**
 - Based on the real world
 - Take cues from reality to help define rules and parameters
 - Easily understood by its components
- **Abstract**
 - Do not incorporate nongame information
 - Examples: Checkers, playing-card games, dominoes, golf, Tetris



Requirement 3

Define the term intellectual property. Describe the types of intellectual property associated with the game design industry. Describe how intellectual property is protected and why protection is necessary. Define and give an example of a licensed property.





- **Abbreviated as IP**
- **Refers to creations of the mind**
 - Inventions, literary and artistic works, designs, symbols, names, and images
- **Why is protection necessary?**



- **Types of IP**

- **Copyrights**

- Protects original works of authorship; books, music, art, software
 - Protects against reproduction and distribution
 - Lasts for life + 70 years non-renewable
 - Takes 3 to 6 months to obtain

- **Patents**

- Grants property rights on inventions
 - Excludes others from making or selling
 - Lasts for 14 to 20 years
 - Takes a long time, expensive, high fees



- **Types of IP continued...**

- **Trademarks**

- **Word, phrase, symbol, or design that distinguishes one business from another**
- **Must do a thorough search to ensure not already in use**
- **Filing is complicated, attorneys usually used**

- **Trade Secrets:**

- **Formula, process, device, or other information that kept secret provides an advantage**
- **No protection if filed**
- **Must take steps to protect it from others**
- **NDA – Non-disclosure agreements**

Requirement

3

IP

Example

Copyright



SONATE.

355

Op. 49, № 1.

19. *Andante.*

20. *Andante.*

25. *Andante.*

30. *Andante.*

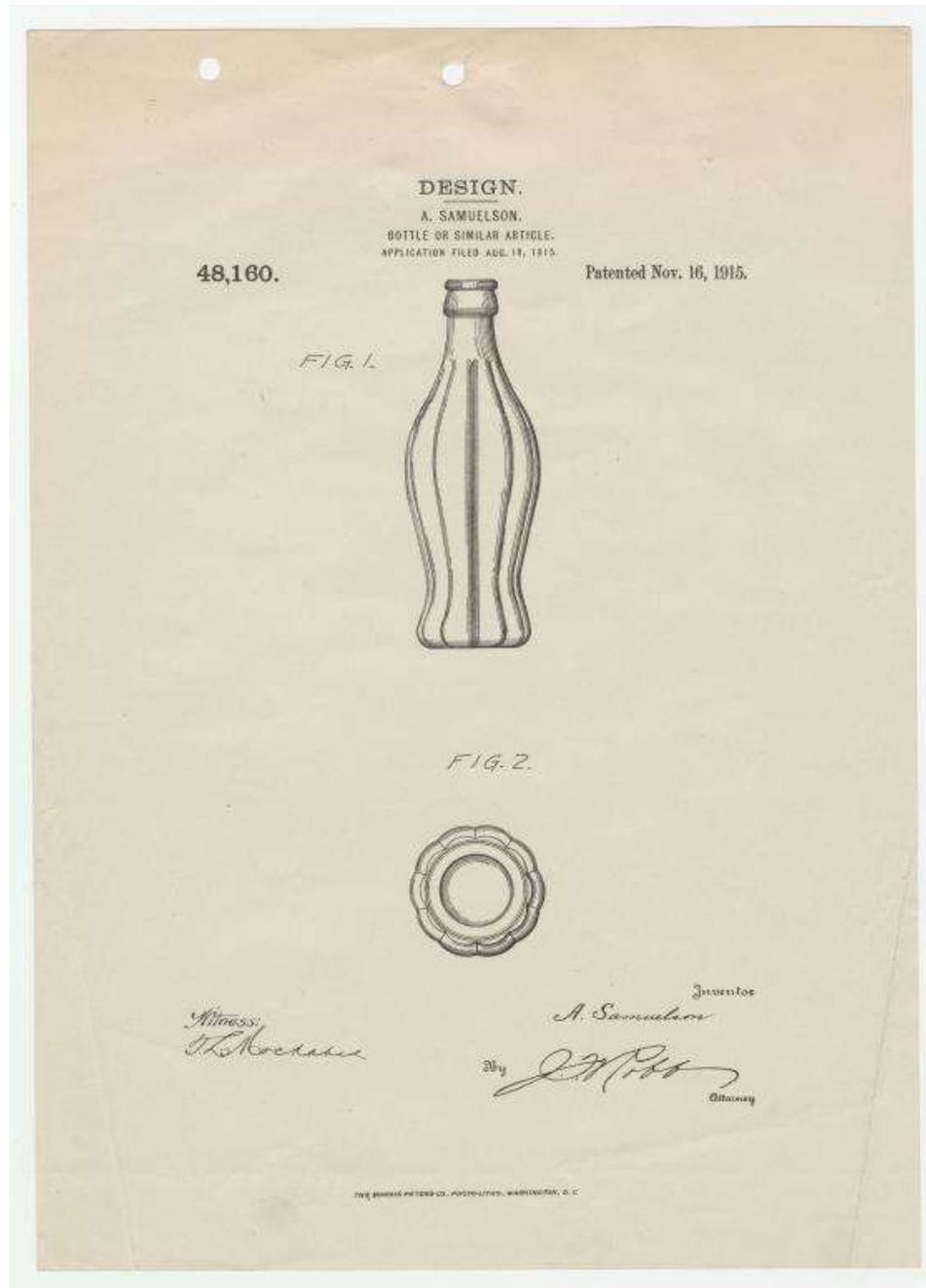
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Requirement

3

IP
Example

Patent



Requirement

3

IP

Example

Trademark





- **Coca-Cola Recipe**
 - in 2006 a Coca-Cola employee and two accomplices tried to sell the Coke recipe to Pepsi. To its credit, Pepsi promptly notified Coke officials, and the group was busted.
- **Google Search Algorithm**
- **WD-40**
- **Big Mac Special Sauce**
- **Kentucky Fried Chicken Breading**



Requirement 4

Do the following:

- a) Pick a game where the players can change the rules or objectives (examples: basketball, hearts, chess, kickball). Briefly summarize the standard rules and objectives and play through the game normally.
- b) Propose changes to several rules or objectives. Predict how each change will affect game play.
- c) Play the game with one rule or objective change, observing how the players' actions and emotional experiences are affected by the rule change. Repeat this process with two other changes.
- d) Explain to your counselor how the changes affected the actions and experience of the players. Discuss the accuracy of your predictions.



4a

Pick Game

UNO



- **Which game to play?**
 - UNO
- **Why?**
 - Turn based, simple rules, strategy, well known, fits our time needs.
- **Review rules**
 - Play it by the book.

Requirement

4b

Change
Rules

Predict
game
play

- **Which rule to change?**
- **How do you think the game play will change?**



Requirement

4c

Play
Changed
Game

- **Play game with 1 rule change**
- **What changed with game play and emotional experience**

- **Repeat 2 more times watching for differences and discuss**



Requirement

4d

Review
Actual
With
Prediction

- **How did game play change?**
- **What strategies changed?**
- **What emotions changed?**
- **Did the game get harder or easier?**
- **Did play last longer or shorter?**
- **Any other observations?**





Requirement 5

Design a new game. Any game medium or combination of mediums is acceptable. Record your work in a game design notebook.

- a) Write a vision statement for your game. Identify the medium, player format, objectives, and theme of the game. If suitable, describe the setting, story, and characters.**
- b) Describe the play value.**
- c) Make a preliminary list of the rules of the game. Define the resources.**
- d) Draw the game elements.**





- **Do you already have a game in mind?**
- **If yes, present it for review**
- **If not, discuss what it could be**

- **Record in your book the following:**
 - **Vision statement, medium, player format, objectives, theme, setting, story, characters, as appropriate**
 - **Describe the play value**
 - **Create a preliminary list of rules and resources**
 - **Draw the game elements**



Requirement 6

Do the following:

- a) **Prototype your game from requirement 5. If applicable, demonstrate to your counselor that you have addressed player safety through the rules and equipment.**
- b) **Test your prototype with as many other people as you need to meet the player format. Compare the play experience to your descriptions from requirement 5b. Correct unclear rules, holes in the rules, dead ends, and obvious rule exploits. Change at least one rule, mechanic, or objective from your first version of the game, and describe why you are making the change. Play the game again. Record whether or not your change had the expected effect.**
- c) **Repeat 6b at least two more times.**





Requirement 7

Blind test your game. Do the following:

- a) Write an instruction sheet that includes all of the information needed to play the game. Clearly describe**
- b) how to set up the game, play the game, and end the game. List the game objectives.**
- c) Share your prototype from requirement 6 with a group of players that has not played it or witnessed a previous play test. Provide them with your instruction sheet(s) and any physical components. Watch them play the game, but do not provide them with instruction. Record their feedback in your game design notebook.**
- d) Share your game design notebook with your counselor. Discuss the player reactions to your project and what you learned about the game design process. Based on your testing, determine what you like most about your game and suggest one or more changes.**





Requirement 8

Do ONE of the following:

- a) With your parent's permission and your counselor's approval, visit with a professional in the game development industry and ask him or her about his or her job and how it fits into the overall development process. Alternately, meet with a professional in game development education and discuss the skills he or she emphasizes in the classroom.
- b) List three career opportunities in game development. Pick one and find out about the education, training, and experience required for the profession. Discuss this with your counselor. Explain why this profession might interest you.



Requirement

8b

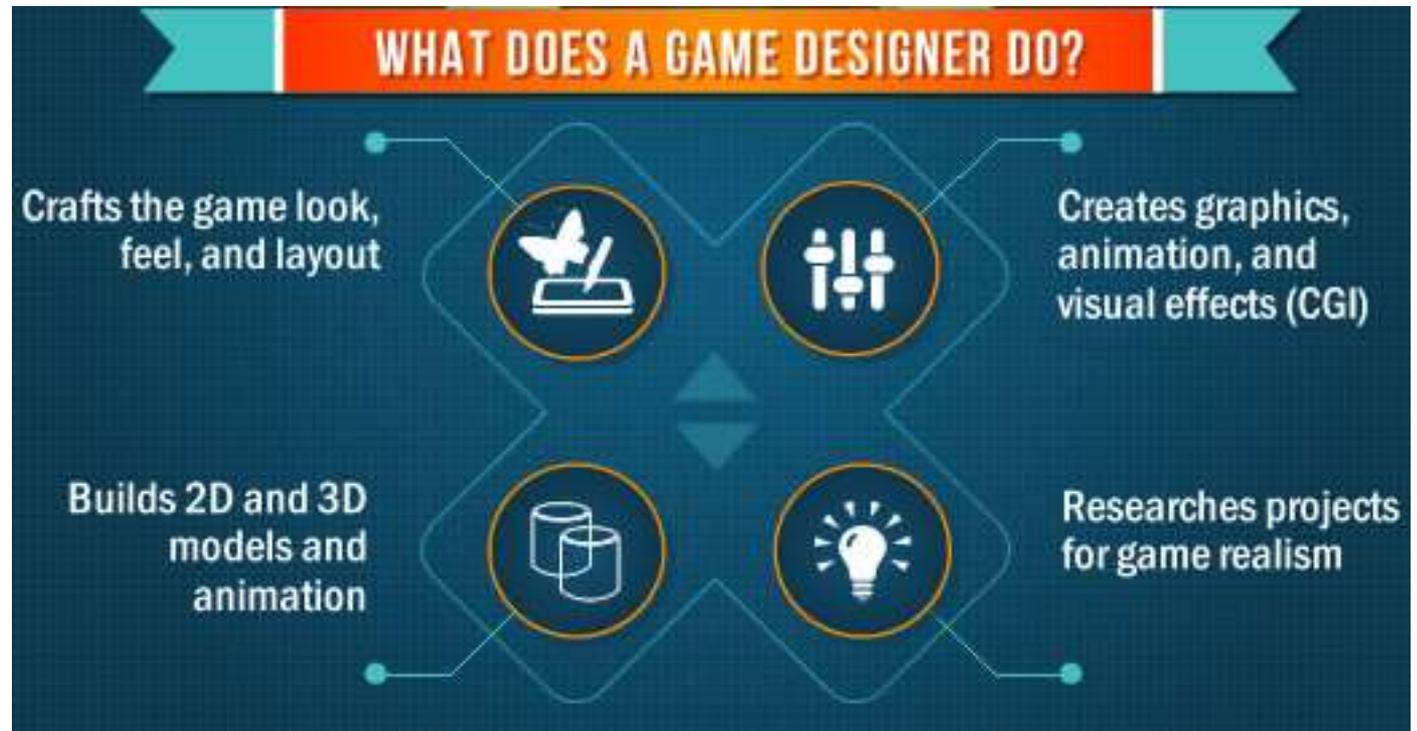
Job
Require-
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Requirement

8b

Job
Require-
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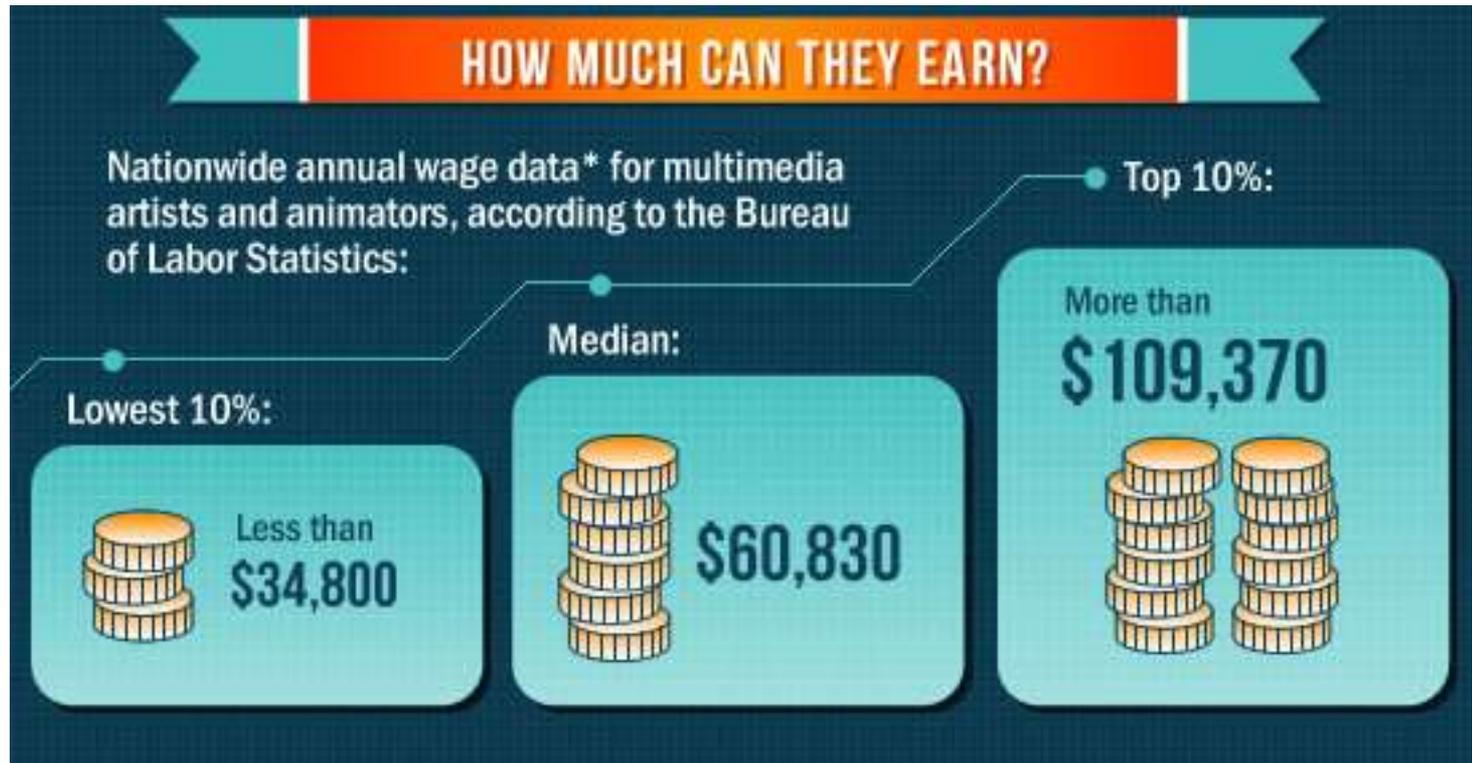




Requirement

8b

Job
Require-
ments



Requirement

8b

Job Requirements



Requirement

8b

Job Requirements



WE'RE NOT PLAYING AROUND HERE: KEY SKILLS

Comprehensive understanding of game-play theory		Good communication and presentation skills	
Talent for thinking imaginatively and creatively		Strong storytelling and narrative development skills	
Ability to work collaboratively and independently		Proficiency in math and programming	

Requirement

8b

Job
Require-
ments



TOP 5 UNDERGRADUATE VIDEO GAME DESIGN PROGRAMS

According to the Princeton Review:

- 1** **University of Southern California**
Interactive Media Division & Computer Science (Game Development)
- 2** **University of Utah**
Entertainment Arts & Engineering
- 3** **DigiPen Institute of Technology**
Game Design
- 4** **Art Institute of Vancouver**
Game Art & Design, Visual & Game Programming, Animation & Games
- 5** **Michigan State University**
Specialization in Game Design & Development

Requirement

8b

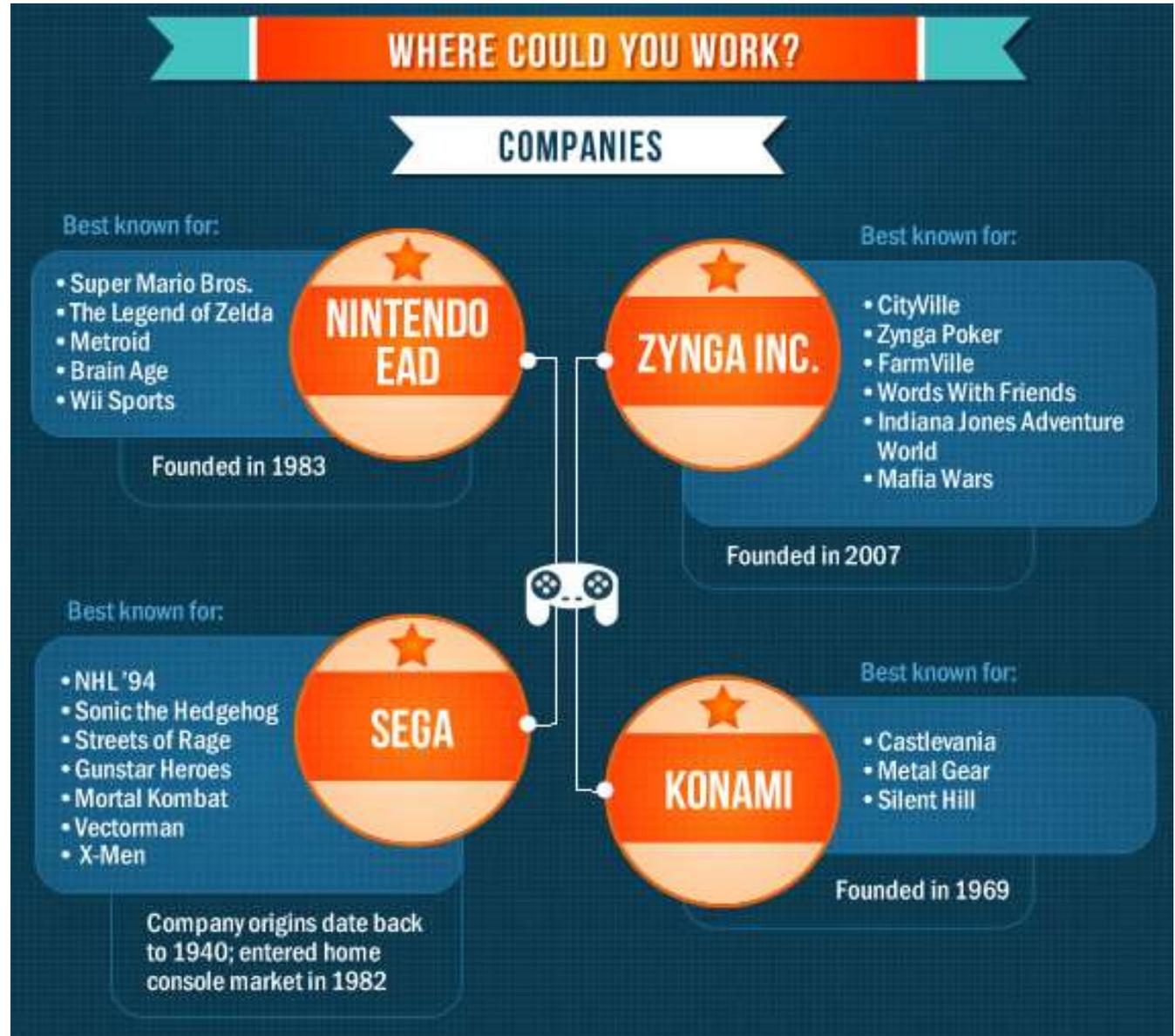
Job Requirements



Requirement

8b

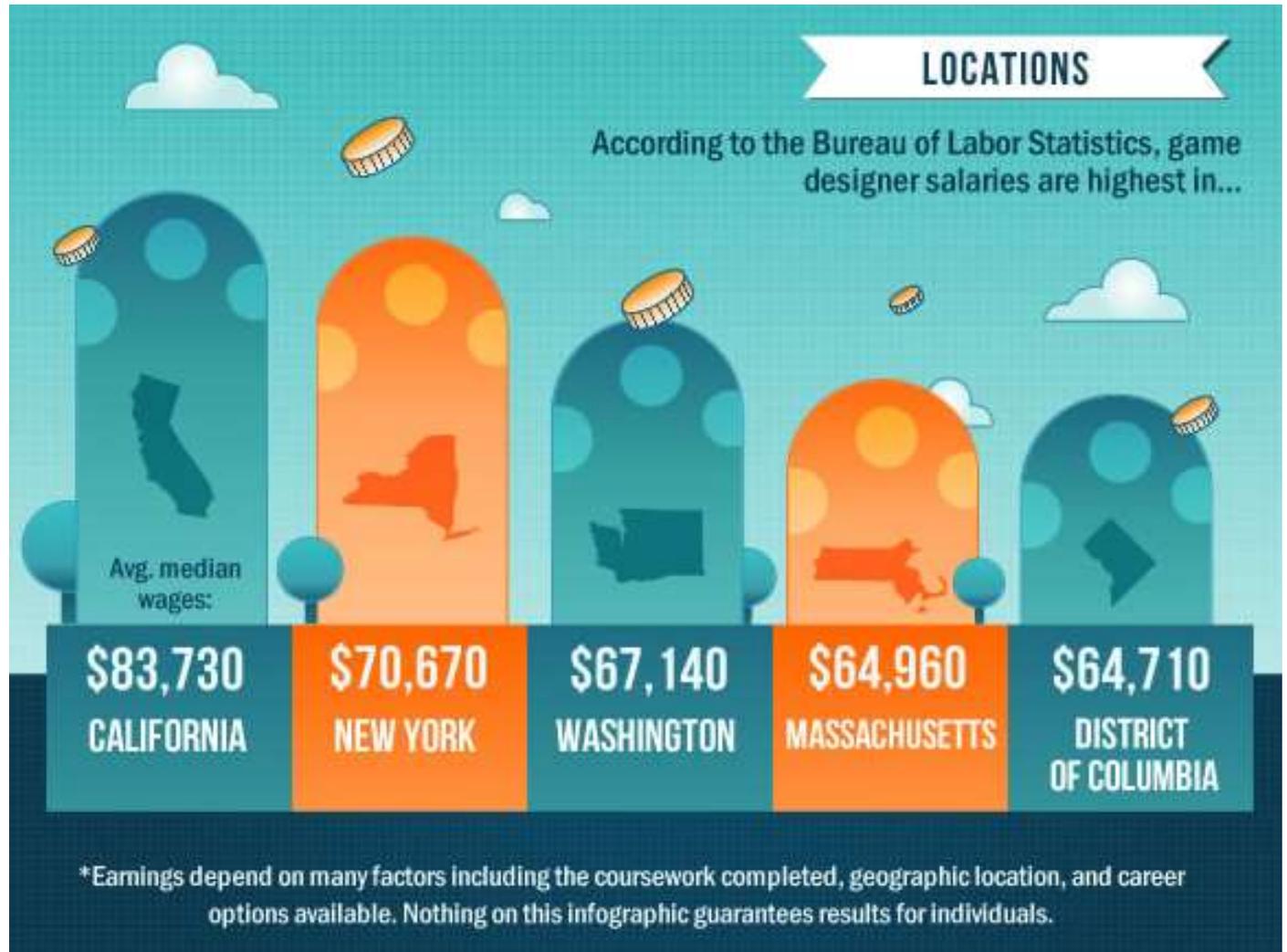
Job
Require-
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Requirement

8b

Job Requirements



Requirement

8b

Job Require- ments



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- **Game Designer**
 - Responsible for all aspects of gameplay. They create a blueprint of how everything is going to work.
- **Mechanics Designer**
 - Ensures gameplay is balanced throughout the game
- **Level Designer**
 - Designs levels, missions, environments, and the goal
- **Writer**
 - Creates the game's story, dialog, narration, tips, and menu text
- **Lead Designer**
 - Most experienced person on team
 - Responsible for pulling everything together

Requirement

8b

Careers

Artists



- **Concept Artist**
 - Traditional hand and computer drawn imagery. Responsible for look and feel of the game.
- **Modeller**
 - Designs 3D models for characters, creatures, objects, etc.
 - Needs to understand human and animal anatomy
- **Environment Artist**
 - Terrain features, landscapes, architecture, non-character objects
- **Texture Artist**
 - Creates textures and skins to be used to cover models, objects, terrain, etc.

Requirement

8b

Careers

Artists



- **Animator**
 - Works with 3D models to create the illusion of movement
 - Needs to understand physics and anatomy
- **Cinematic Artist**
 - Works with storyboards to generate scenes
 - Needs to understand timing and film concepts
- **Technical Artist**
 - Serve as problem solvers for the art team, not part of the creation process
- **UI Artist**
 - Deals with on-screen info, text, menus, and other parts of the user interface
- **Art Director**
 - Person responsible for all the artists

Requirement

8b

Careers

Programmers



- **Junior Programmer**
 - Intern or entry-level programmer
 - Works on small and simple tasks
- **Engine Programmer**
 - Design and program engine on which the game will be run
 - Needs to understand physics, graphics, know of many other roles
- **Graphics Programmer**
 - Skilled in 3D modeling, special effects
 - Excels in advanced math; high expertise = high pay
- **AI Programmer**
 - Develops the logic and rules to simulate artificial intelligence
- **Audio Programmer**
 - Responsible for sound engine and sound effects
- **Network Programmer**
 - Online experience, network security, client/server
- **Lead Programmer**
 - Responsible for the programming team

My Contact Info



- **EMAIL:**
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West Chester, OH 45044

Help clean up please!





Blue Cards

- Fill all dates, even those for the counselor
- If getting partial, fill out numbers and dates on back in table. I will initial each as I review.
- Do not present card unless it is filled out

The image shows a blue application form for a merit badge. It is divided into four main sections:

- Information for Applicant:** Contains instructions for the applicant, such as "Fill in your proposed application in your own handwriting" and "Do not change any information on this card unless you have been instructed to do so by your counselor."
- Information for Counselor:** Contains instructions for the counselor, such as "Review this application and sign it if you agree to sponsor the applicant's work" and "Do not change any information on this card unless you have been instructed to do so by your counselor."
- APPLICATION FOR MERIT BADGE:** A form with fields for Name, Address, City, State, and Zip. It also includes checkboxes for "Is applicant?" (Yes/No) and "Is applicant?" (Yes/No/Partial). There is a section for "Counselor's Name" and "Counselor's Address".
- APPLICANT'S RECORD:** A section for the applicant to record their progress, with fields for "Date of Completion", "Counselor's Initials", and "Date of Completion".
- COUNSELOR'S RECORD:** A section for the counselor to record their progress, with fields for "Date of Completion", "Counselor's Initials", and "Date of Completion".

