George Mason University
Department of Computer Science
CS 325 – Spring 2014
Mid-term review (unabridged)

Game Design Workshop, 2nd edition

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- ## Part One: Game Design Basics
  - ### Chapter 1: The Role of the Game Designer
    - Game designer envisions how a game will work during play:
      - objectives, rules, procedures
      - dramatic premise
      - planning
    - **Playcentric** approach: iterative method based on player feedback
    - An advocate for the player.
    - **Playtesters** are people who play your game and provide feedback on the experience.
      - You learn so much by watching others play your game.
      - Game design is an unpredictable process.
    - **Exercise** 1.1: Become a Tester. Play a game and observe yourself. Write down what you are doing (behaviors and actions) and feeling. Repeat while watching a friend play the same game.
    - Skills of a game designer:
      - communication: sell your game and listen to testers and teammates and compromise
      - teamwork: speak the language of all of the specialists on the team
      - process: games are interconnected systems. playcentric approach.
      - inspiration: look at the world as systems. find games in everything, such as your passions. don't look at other games for original ideas.
      - become a better playtester: analyze as you play games. To practice an art form, understand what makes it work. Keep a game journal.
      - creativity: everyone is creative in different ways.
    - **Exercise** 1.2: D.O.A. Name a game you played that was DOA (no fun). What didn't you like about it? What did the designers miss? How could it have been improved?
    - **Exercise** 1.3: Your life as a game. List five areas of your life that could be games. Briefly describe a possible underlying game structure for each.

- **Exercise** 1.4: Game Journal. Think deeply about your game experience. What were your choices, thoughts, and feelings about them, and the underlying game mechanic? What were meaningful moments and why do they stand out?
- **Exercise** 1.5: Your Childhood. List ten games you played as a child. What was compelling about each?
- **Playcentric design process**
  - always keep the player experience in mind
  - test with target players throughout development
- **Player experience goals** are goals that the game designer sets for the type of experience that players will have during the game.
  - Not features. Descriptions of situations you want players to find themselves in.
- Prototype and play test early.
  - Make a physical prototype to get instant feedback on the idea without programmer or artist time.
- **Core mechanic** is the central activity of a game. It is a repetitive process or action performed throughout the game.
- **Iteration** means that you design, test, and evaluate over and over again through the development of your game, improving each time until the player experience meets your criteria.
    1. Player experience goals are set.
    2. An idea or system is conceived.
    3. An idea or system is formalized (written down or prototyped).
    4. An idea or system is tested against player experience goals (e.g. playtested)
    5. Results are evaluated.
    6. If results are negative and the idea or system is fundamentally flawed, go back to step one.
    7. If results point to improvements, make them and test again.
    8. If results point to success, you're done!
- Creating a game
  - Step 1: Brainstorming
    - Set player experience goals. Come up with game concepts and mechanics. Narrow to three.
    - A **treatment** or **concept document** is a short, one-page description of an idea. Write one for each of the three.
  - Step 2: Physical Prototype
    - Create a physical prototype and play test it.
  - Step 3: Presentation
    - You make this to secure funds or introduce the game to your team.
    - Demo artwork.
    - Write a three- to six-page **gameplay treatment** describing how the game works.
  - Step 4: Software Prototype(s)

        - Create one or several software prototypes for each aspect of the system (Chapter 8).
        - Hack it (temporary graphics, throwaway code)
        - Playtest
    - Step 5: Design Documentation
        - Compile your notes and ideas for the "real" game into the design document, the document that outlines every aspect of the game and how it works. Nowadays, a wiki.
    - Step 6: Production
        - Staff up and begin production, in which you create the real artwork and programming.
        - Don't lose sight of the playcentric process. Test your artwork, gameplay, characters, etc. throughout.
        - The problems you find and changes you make should get smaller and smaller, because you solved the big problems during the prototyping phases.
        - This is the time when most game designers actuall design their games, which leads to frustration and problems with time and money.
    - Step 7: Quality Assurance
        - Testing with an eye towards usability.
        - Make sure your gameplay is solid before beginning this phase.
- Make time for playtesting in any production schedule.
    - In the game industry, designers often skip physical prototypes and jump from concept stage to design doc to implementation.
    - If you are making a small variation on an existing game, you can often get away with this.
- Designing for Innovation
    - There is a renaissance of interesting games broadening games' appeal.
        - Designing games with unique play mechanics—thinking beyond existing genres of play
        - Appealing to new players—people who have different tastes and skills than hard-core gamers
        - Trying to solve difficult problems in game design such as:
        - The integration of story and gameplay
        - Deeper empathy for characters in games
        - Creating emotionally rich gameplay
        - Discovering the relationships between games and learning
        - Asking difficult questions about what games are, what they can be, and what their impact is on us individually and culturally
    - Playcentric approach gives you a solid process to explore gameplay innovation, "to try ideas that might seem fundamentally unsound but could have within them the seed of a breakthrough game and to craft them until they are playable."
- Designers You Should Know
    - Shigeru Miyamoto

- Will Wright
- Sid Meier
- Warren Spector
- Richard Garfield
- Peter Molyneux
- Gary Gygax
- Richard Garriott

- Chapter 2: The Structure of Games

- **Exercise** 2.1: Think of a Game
  - Think of a game and describe it in detail.
  - Repeat with a completely different type of game.
  - Compare the two descriptions. Which elements were different and which were similar?
- Games, no matter how dissimilar, share some common elements.
- Go Fish vs. Quake
  - Physical / virtual
  - Deck of cards / computer
  - Copyrighted / public domain verbal rules
  - Both designed for players.
- Players
  - The player is a voluntary participant who both partakes in and consumes the entertainment.
  - Active, make decisions, invested, potential winners
  - Must voluntarily accept the rules and constraints of the game
  - "lusory attitude" (Bernard Suits): "the curious state of affairs wherein one adopts rules which require one to employ worse rather than better means for reaching an end." E.g. you use a club to hit a golf ball instead of picking the ball up.
  - Besides games, what other forms of entertainment demand active participation by their consumers?
- **Exercise** 2.2: Players
  - Describe how players might join or start a game of Go Fish versus (single player) Quake.
  - What steps do they need to take (social, procedural, or technical)?
  - Are there any similarities?
- Objectives
  - Both lay out specific goals for the player.
  - Go Fish: Get the most books.
  - Quake: Stay alive and complete the level.
  - When you watch a movie or read a book, the book or movie has nothing for you to accomplish.
  - In games, the objective is a key element that gives the experience much of its structure.
- **Exercise** 2.3: Objectives
  - Describe the objective of a game in one sentence.
  - Repeat for five games.
- Procedures
  - Both give detailed instructions on what players can do to achieve the game objectives.
  - The actions or methods of play allowed by the rules.

    - They guide player behavior in ways that would not otherwise occur.
    - In Go Fish, it would be easier to ask everyone about a rank, rather than one person at a time.
- Rules
    - Both descriptions spend a great deal of time explaining exactly what objects the game consists of and what players cannot and can do.
    - Rule statements define game objects and concepts.
        - Objects: deck of cards, draw pile, weapons
    - Rules limit player behavior and proscribe reactive events.
    - Game rules have authority due to the implicit agreement by the players to submit themselves to the experience.
    - Without them, you're not playing the game.
- **Exercise** 2.4: Rules
    - Can you think of a game that has no rules?
    - If so, can you describe it?
    - How about one rule?
    - Why is this difficult?
- Resources
    - Certain objects that seem to hold important value.
    - Go Fish: cards of each rank
    - Quake: weapons and ammunition
    - Resources are objects that are simultaneously valuable because they help the player achieve their goal, yet scarce (because the game was designed that way).
    - Finding and managing them is a key part of many games.
- Conflict
    - Both games lay out specific objectives. Yet the procedures and rules limit players from accomplishing the goals directly. This is conflict.
    - Go Fish: You can't simply ask everyone or rifle through the deck.
    - Quake: You can't just walk through enemies.
- **Exercise** 2.5: Conflict
    - Compare and contrast the conflict in football to poker.
- Boundaries
    - The rules and goals of the game only apply in the game, and not in "real life."
    - Quake: Virtual architecture doesn't affect your real life.
    - Go Fish: Conceptual boundaries that you don't bring in extra cards.
    - Homo Ludens (Johan Huizinga) calls the physical and/or conceptual space in which a game takes place the "magic circle" (temenos), a temporary world where the rules of the game apply rather than the rules of the ordinary world.
    - arena, card table, temple, stage, screen, court
- Outcome
    - Both games have an uncertain yet measurable outcome (winner, loser).

    - Outcome differs from the objective; all players may be able to achieve the objective (get books in Go Fish), but an outcome measurement determines who wins (most books).
    - Uncertainty: if players can anticipate the outcome, they stop playing (at least the weaker position does...). Uncertainty also provides replayability.
- Formal Elements
    - Scholars from different fields have examined formal elements in games (conflict studies, economics, behavioral psychology, sociology, anthropology).
    - We just want a useful context, conceptual tools, and a vocabulary to discuss the playcentric design process.
    - As with any art form, we understand and master the traditional structures so that we can experiment with alternatives.
- Engaging the Player
    - Challenge
        - Too difficult, frustrating
        - To easy, boring
        - Balance for flow.
        - **Exercise** 2.6: Name three games that you find particularly challenging and describe why.
    - Play
        - Play itself is not a game.
        - "Free movement within a more rigid structure" (Salen and Zimmerman)
        - Can be serious, like an important chess match
- Engaging the Player
    - Premise
        - **Exercise** 2.7: Name premises
    - Character: agent through which dramatic stories are told. Live vicariously.
    - Story: Premise need not go anywhere. Stories unfold.
        - Exercise 2.8: Have any game stories gripped you? Why or why not?
    - Dramatic Elements
- Sum of the Parts
    - Games are systems, and the elements form a complex whole.
    - Designer must be able to look at elements and the whole.
- Defining Games
    - A **game** is:
        - A closed, formal system that
        - Engages players in structured conflict and
        - Resolves its uncertainty in an unequal outcome
    - Look beyond it. There is a realm of possibilities for game designers that exists on the edges of what we consider to be games.
    - **Exercise** 2.9: Analyze dots game.
- Aside: Puzzles by Scott Kim

- “Toy or contrivance designed to amuse be presenting difficulties to be solved by ingenuity or patient effort” —Random House Dictionary
- “a simple task with a bad interface”
- Fun and has a right answer.
  - Form of play. Must be novel (something with a new twist).
  - Not too easy or too hard.
  - Tricky, perhaps involving perceptual shifts
- Well Played Game (Bernie Dekoven): “players are willing to alter the rules to keep the game fun for everyone.”
- Story - No interaction
- Toy - No goal
- Puzzle - Goal
- Game - winning

- Chapter 3: Working with Formal Elements

- **Exercise** 3.1: Poker
  - Take away the "raising" procedure, so that you state your amounts once simultaneously. What happens?
  - Also allow people to draw from the deck as many times as they want. What changes?
  - Require everyone to play with their cards visible to all the other players. Is the game still playable?
- Formal Elements
  - **Formal elements** are those elements that form the structure of a game: **players, objectives, procedures, rules, resources, conflict, boundaries,** and **outcome**.
- Players
  - Players must voluntarily accept the rules and constraints of the game.
  - They enter Huizinga's "magic circle".
  - We perform actions we would never otherwise consider:
    - shooting, killing, betrayal
  - We perform actions we would like to think ourselves capable of:
    - courage in the face of long odds, sacrifice, difficult decisions
- Invitation to Play
  - Other arts:
    - paintings have frames
    - stages have curtains (curtains draw back)
    - movies have screens (lights dim)
  - Games
    - multiplayer: players invite each other to play
    - single player: players open solitaire deck or launch program
    - more fun: Guitar Hero controller makes the fantasy more visceral. [Have players make and wear something, like a crown or stethoscope, when playing your game.]
- Players: Number and Roles
  - Number of players: one, two, four, two-to-eight, as many as 10,000
  - **Exercise** 3.2: Create a three-player version of tic-tac-toe
  - Roles of players:
    - uniform
      - chess or monopoly
    - non-uniform
      - Mastermind (both roles must be filled)
      - football
      - role-playing games
  - Play styles: Richard Bartle (created the first MUD) classifies players into achievers, explorers, socializers, killers
- Player Interaction Patterns
  - Single player versus game
    - Player competes against the game system.

    - Examples: solitaire, Pac-Man, 7th Guest, Tomb Raider.
    - The most common pattern for digital gaming.
    - So popular, that we have to call non-solo-games "multiplayer", even though multiplayer was the historical default.
    - Tend to include puzzles or other play structures that create conflict.
  - Multiple individual players versus game
    - Multiple players competes against a game system in each others' company. (There is no "in-game" interaction between participants.)
    - Examples: bingo, roulette. Slingo? Olympics?
    - Rare for digital gaming.
    - Good for non-competitive players who enjoy the activity and the socialization.
  - Player versus player
    - Two players directly compete.
    - Examples: checkers, chess, tennis, Street Fighter II
    - Personal contest.
    - Good for competitive players.
  - Unilateral competition
    - Two or more players compete against one player.
    - Examples: tag, dodge ball, Scotland Yard.
    - Combines cooperative and competitive gameplay.
    - "Wide open for digital game development"
  - Multilateral competition
    - Three or more players directly compete.
    - Examples: poker, Monopoly, Quake, WarCraft III, etc.
    - What people think of when they think of "multiplayer gaming"
    - Doesn't have to be massively multiplayer. Board games have been tuned for three to six players.
    - Suggestion: Tune your multiplayer game to encourage the same level of social interaction as a board game.
  - Cooperative play
    - Two or more players cooperate against the game system.
    - Examples: Pandemic, Harvest Time, Lord of the Rings board game, Arkham Horror board game, World of Warcraft quests, many role-playing games. Second Life?
  - Team competition
    - Two or more groups compete.
    - Examples: soccer, basketball, charades, Tribes, Team Fortress.
    - Team sports are very successful in real life. Fun for the fans, too.
- **Exercise** 3.3: Interaction Patterns
  - List your favorite games for each player interaction pattern. If you don't know any, do some research and play several of them.
    - Single player versus game
    - Multiple individual players versus game
    - Player versus player

    - Unilateral competition
    - Multilateral competition
    - Cooperative play
    - Team competition
- **Objectives** define what players are trying to accomplish within the rules of the game.
    - They give players something to strive for.
    - In addition to the challenge, they can also set the game's tone (capture or kill versus spell long words).
    - You can give different players different objectives, several possible objectives, or let them make their own.
    - There can be partial objectives or miniobjectives.
    - Objectives can be integrated into the story and affect the dramatic aspects.
    - What are objectives of games you've played?
    - What impact to these objectives have on the tone of the game?
    - Do genres lend themselves to certain objectives?
        - ("Meet the Pyro")
    - What about multiplayer objectives?
    - Do objectives have to be explicit?
    - What about player-determined objectives?
    - Example Objectives
        - Connect Four: Be the first player to place four units in a contiguous line on the playing grid.
        - Battleship: Be the first player to sink all five of your opponent's ships.
        - Mastermind: Deduce the secret code of four colored pegs in as few steps as possible.
        - Chess: Checkmate your opponent's king.
        - Clue: Be the first player to deduce who, where, and how a murder was communicated.
        - Super Mario Bros.: Rescue Princess Toadstool from the evil Bowser by completing all eight worlds (32 levels) of the game, each of which have their own miniobjectives.
        - Spyro the Dragon: Rescue your fellow dragons who have been turned to stone, and defeat the evil Gnasty Gnorc by completing all six worlds of the game, each of which have their own miniobjectives.
        - Civilization: Option 1: conquer all other civiliza- tions on the board, or Option 2: colonize the star Alpha Centauri.
        - The Sims: Manage the lives of a virtual household; as long as you can keep your household alive, you can set your own goals for the game.
    - Objective: Capture
        - The objective in a capture game is to take or destroy something of the opponent's, while avoiding being captured or killed.
        - Chess, checkers, Quake, RTS like WarCraft
    - Objective: Chase

    - The objective in a chase game is to catch an opponent or elude one, if you are the player being chased.
    - Single player versus, player versus player, or unilateral competition.
    - Examples: Tag, Fox & Geese, assassin
  - Objective: Race
    - The objective in a race game is to reach a goal—physical or conceptual—before the other players.
    - Examples: footrace, Sorry, Virtua Racing, backgammon
    - Players rely on skill or chance or both.
  - Objective: Alignment
    - The objective in an alignment game is to arrange your game pieces in a certain spatial configuration or create conceptual alignment between categories of pieces.
    - Examples: tic-tac-toe, solitaire, Connect Four, Othello, Tetris, Bejeweled or any "match-three" game.
    - Puzzle-like.
  - Objective: Rescue or Escape
    - The objective in a rescue or escape game is to get a defined unit or units to safety.
    - Examples: Super Mario Bros., Prince of Persia, Ico.
    - Partial objectives or miniobjectives are often puzzle-like.
  - Objective: Forbidden Act
    - The objective in a forbidden act game is to get the competition to break the rules by laughing, talking, letting go, making the wrong move, or otherwise doing something they shouldn't.
    - Examples: Twister, Operation, staring contest, serious face.
    - Not found in digital games.
  - Objective: Construction
    - The object in a construction game is to build, maintain, or manage objects; this might be within a directly competitive or indirectly competitive environment.
    - Like a sophisticated alignment game.
    - Examples: Animal Crossing, SimCity, Settlers of Catan.
    - Often use resource management or trading as core gameplay element.
    - Often strategic choice rather than chance or dexterity.
    - Easy to make open-ended.
- Objective: Exploration
  - The object in an exploration game is to explore game areas.
  - Almost always combined with other objectives (puzzle solving, combat, find treasure).
  - Examples: Adventure, Zelda, Ultima, EverQuest
- Objective: Solution
  - The object in a solution game is to solve a problem or puzzle before (or more accurately) than the competition.
  - Examples: Myst, text adventures, Tetris, Connect Four, Tic-Tac-Toe, Mario/Zelda
- Objective: Outwit

    - The object in a game of wits is to gain and use knowledge in a way that defeats the other players.
    - Examples: Trivial Pursuit, Jeapardy!, Diplomacy, Survivor
- This isn't an exhaustive list.
- Games often mix them.
- **Exercise** 3.4: List ten of your favorite games and name the objectives for each. Do you see any similarities in these games? Try to define the type or types of games that appeal to you.
- **Procedures** are the methods of play and the actions that players can take to achieve the game objectives.
    - Who does what, where, when, and how?
        - Who can use the procedure? One player? Some players? All the players?
        - What exactly does the player do?
            - Where does the procedure occur? Is the availability of the procedure limited by location?
        - When does it take place? Is it limited by turn, time, or game state?
        - How do players access the procedure? Directly by physical interaction? Indirectly through a controller or input device? By verbal command?
    - Most games tend to have:
        - Starting action: How to put a game into play.
        - Progression of action: Ongoing procedures after the starting action.
        - Special actions: Available conditional to other elements or game state.
        - Resolving actions: Bring gameplay to a close.
    - In board games, all procedures are described in the rule sheet and put into action by the players. In digital games, they are the "controls".
        - Rules might be hidden from players in a digital game!
    - Player inputs and actions
    - Connect Four
        - Someone goes first; take turns dropping a colored checker down the slots; someone wins when they get four of one color in a row (horizontally, vertically, or diagonally)
    - Super Mario Brothers
        - select/start; left/right to walk, down to crouch, A to jump/swim, B to accelerate or throw fireballs
    - Comparison
        - Both have starting actions.
        - In Mario, the progression is implied by the actions (the game simulates the world) and some actions are conditional.
        - Connect Four states its resolving action, but Mario doesn't because the game decides.
    - System Procedures
    - Digital games can have complex states and system procedures that work behind the scenes, responding to situations and player actions.

    - Examples: A very complex calculation for the damage done by a weapon in a role-playing game.
- Keep in mind the limitations of the environment in which your game will be played.
    - Keep the rules simple for a nondigital game.
    - What kind of controller will players use?
- **Rules** define game objects and allowable actions by the players.
    - How do players learn them? Who will enforce them? They can be unstated, but players may feel cheated if they're not understandable (explicitly or intuitively).
    - They can close loopholes, such as "Do not pass Go, do not collect $200".
    - Examples:
        - Poker: A straight is five consecutive cards; a straight flush is five consecutive cards of the same suit
        - Chess: A player can't move the king into check.
        - Go: A player can't make a move that recreates a previous state of the board ("ko").
        - WarCraft II: To create knights, a player must have upgraded to a keep and built a stable.
        - You Don't Know Jack: If a player answers incorrectly, the other players get a chance to answer.
    - Rules defining objects and concepts
        - Objects in games have a unique status and meaning that is different from objects in the real world.
        - Game objects can be made up completely (straight flush).
        - If based on familiar objects, they are still only abstractions (king in chess).
    - Rules restricting actions
        - In chess, a player can't move their king into check prevents accidental loss. In Go, "ko" prevents loops.
    - Basic delimitations
        - dimensions of football field, one goalie in soccer
    - Note: Rules overlap with other formal aspects (e.g. players and boundaries); in fact, all formal aspects are represented in the rules or procedures.
    - **Exercise** 3.6: What rules within the following games restrict player actions? Twister, Pictionary, Scrabble, Operation, Pong
- Rules determining effects
    - Rules can trigger effects based on circumstances.
        - If/then statements
        - You Don't Know Jack: "If a player answers incorrectly, the other players get a chance to answer."
- Defining rules
    - Rules need to be clear to players or intuitively grasped in order to seem fair.
    - The more complex your rules are, the more demands you will place on the players to comprehend them.
- **Exercise** 3.7: Rules for Blackjack

- In the same way that you wrote down the procedures for blackjack in Exercise 3.5, now write down the rules. It is harder than you think. Did you remember all the rules? Try playing the game as you have written it. You might realize that you have forgotten some- thing. What rules did you forget? How did those miss- ing rules affect the play of the game?

- **Resources** are assets that can be used to accomplish certain goals. Resources must have utility and scarcity.
  - Managing resources and determining how and when players can access them is a key part of the game designer's job.
  - What resources should there be? Why paperclips and sushi in Katamari Damacy but not Diablo II?
  - **Exercise** 3.8: Utility and Scarcity. What are the resources in Scrabble and Doom? How are they useful? How does the game make them scarce?
  - **Lives**: Limited number of tries
  - **Units**: when the player is represented by more than one object; finite or renewable
  - **Health**: Can be a resource that is acquired and upgraded, or just an attribute that depletes.
  - **Currency**: in-game economy. Could barter instead.
  - **Actions**: Moves or turns (20 Questions, Magic: The Gathering, Bullet Time) can be a resource.
  - **Power-ups**: magic mushroom in Super Mario Brothers
  - **Inventory**: Collect and manage objects; can be limited size.
  - **Special Terrain**: Triple letter squares in Scrabble, resource mines in StarCraft
  - **Time**: Speed chess, hot potato, arcade racing game
  - Challenge you to create original types or unusual crossovers!
  - **Exercise** 3.9: Resource Types. Describe your favorite games that use the aforementioned resource types.
- **Conflict** emerges from trying to accomplish the goals of the game within its rules and boundaries.
  - Designed into the game via the rules, procedures, and situations that prevent players from accomplishing their goals directly.
  - Examples:
    - Pinball: Use only flippers to keep the ball from falling out.
    - Golf: Get the ball into a hole in as few strokes as possible.
    - Monopoly: Manage your money and property to become the richest player.
    - Quake: stay alive while others try to kill you.
    - WarCraft III: Maintain your forces and resources and use them to command and control the map objectives.
    - Poker: Outbid opponents based on your hand and ability to bluff.
  - Three Classic Sources
    - Obstacles:
      - Can be physical, like the sack in a sack race or water on a golf coarse.
      - Can be mental, such as puzzles.

    - Opponents:
        - In multiplayer games, other players are the primary source of conflict.
    - Dilemmas:
        - In Monopoly, whether to buy a property or upgrade a hotel. In Poker, whether to fold or stay in.
    - **Exercise** 3.10: Explain the source of conflict in Tetris, Frogger, Bomberman, Minesweeper, and Solitaire
- **Boundaries** are what separate the game from everything that is not the game.
    - Agreeing to play (Huizinga's "magic circle" again) is a critical part of feeling safe that the game is temporary.
    - Boundaries can be physical (edges or arena, field, or game board) or conceptual (social agreement to play, as in Truth or Dare).
    - What if there were no boundaries to the field in football? What if you could add real money to the bank in Monopoly? What if a chess board expanded infinitely? They become different games.
    - Emotional boundary allows players to shake hands at the end.
    - Alternate reality games play with boundaries.
        - I Love Bees (Halo 2)
        - Cruel 2 B Kind (Ian Bogost and Jane McGonigal)
        - Big Urban Game (Lantz, Salen, Fortugno)
    - **Exercise** 3.11: Boundaries. What are the boundaries in Dungeons and Dragons, physical or conceptual?
- The **outcome** of a game must be uncertain to hold players' attention.
    - Generally resolved through a measurable and unequal outcome, though not always necessary.
        - Massively multiplayer games and simulation games often don't have outcomes. We still call them games, even though some might not.
    - At defined intervals the players (nondigital) or the system check to see if a winning state has been achieved.
    - In zero-sum games, someone's gain is someone else's loss.
        - What games are zero-sum? What outcomes are satisfying?
- Conclusion
    - Formal elements, when set in motion, create what we recognize as a game.
    - By understanding how these elements work together (and thinking about new ways of combing these elements) you can invent new types of gameplay.
    - Use these formal elements to analyze games you play (your game journal!).
- **Exercise** 3.13: Revise the rules and procedures so that they are not dependent on chance. How does this affect the gameplay?
-
- Aside: Persuasive Games by Ian Bogost
    - When we create video games, we start with some system in the real world (traffic, football, etc.).

- We build a model of the source system, by writing code or rules for the behavior we want to focus on.
- **Procedurality** (Murray 1997) is the computer's ability to execute rule-based behaviors; video games are a procedural representation of something.
- Madden Football is one model of football; another might focus on a specific position or on coaching.
- An alternate SimCity might focus on public services.
- These models are always subjective.
- There may be a gap between a designer's procedural model and a player's subjective experience or preconceived expectations about the source system (watching football, living or running a city).
- Video games can persuade with a model that likely differs from the player's.
- "Airport Insecurity": players don't choose what they try to get through security, but can choose whether to throw it in the trash or attempt to carry it through.

- Chapter 4: Working with Dramatic Elements

- **Exercise** 4.1: Making Checkers Dramatic
  - Checkers is abstract; why would you want to capture your opponent's pieces?
  - Devise a set of dramatic elements to make checkers emotionally engaging, such as:
    - backstory
    - give each piece a name and distinctive look
    - define special areas on the board
    - whatever you can think of
- Formal elements work together to create a "game".
- **Dramatic elements** engage players emotionally and invest them in a game's outcome. They provide context to gameplay by overlaying and integrating the formal elements into a meaningful experience.
  - challenge
  - play
  - premise
  - character
  - story
- **Exercise** 4.2: Dramatic Games
  - Name five games that you find dramatically interesting. What is it about those games that you find compelling?
- Challenge can be engaging.
  - Are the challenges of our everyday life engaging?
  - An engaging challenge is satisfying to complete and requires just the right amount of work to create a sense of accomplishment and enjoyment.
  - Challenge is very individualized.
    - Chutes and Ladders is hard if you're learning to count!
  - Challenge is dynamic.
    - A task may be challenging at the beginning of a game, but then you get good at it.
  - Flow
    - Mihaly Csikszentmihalyi
    - Universal principles for enjoyable activities.
      - Regardless of age, social class, or gender.
      - Activities spanned many different disciplines, including performing music, climbing rocks, painting, and playing games.
      - The words and concepts people used to describe their enjoyment were similar.
    - Conditions:
      - Chance of success
      - Able to concentrate
      - Clear goals and immediate feedback
      - Deep but effortless involvement that removes from awareness the worries and frustrations of everyday life

        - Sense of control over your actions
        - Concern for the self disappears (but emerges stronger afterwards)
        - Sense of duration of time is altered (faster or slower)
    - Csikszentmihalyi: "The combination of all these elements causes a sense of deep enjoyment that is so rewarding people feel like expending a great deal of energy is worthwhile simply to be able to feel it."
- As a person gets better at a task, the challenge should increase to match their increasing ability.
- A Challenging Activity That Requires Skill
    - **Exercise** 4.3: List the types of skills required by the games you enjoy. What other types of skills do people enjoy that you could incorporate into the games you design?
- The Merging of Action and Awareness
    - Csikszentmihalyi: "When all of a person's relevant skills are needed to cope with the challenges of a situation, that person's attention is completely absorbed by the activity… People become so involved in what they're doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing"
- Clear Goals and Feedback
    - In life, we often have contradictory goals. In flow experiences, we know exactly what must be done. Consider music, tennis, rock climbing.
    - **Exercise** 4.4: Goals and Feedback. List the types of feedback generated by three different games. How does the feedback relate to the ultimate goal of each game?
- Concentration on the Task at Hand
    - "You're not aware of other problematic life situations. … Once you're in the situation, it's incredible real, and you're very much in charge of it. It becomes your total world."
- The Paradox of Control
    - "Only when a doubtful outcome is at stake, and one is able to influence that outcome, can a person really know she is in control."
    - How to offer meaningful choices to players, without offering complete control or an assured outcome?
- The Loss of Self-Consciousness
    - In everyday life, we think about how we appear to other people and we have self-esteem. In flow, we are too involved to care about protecting the ego.
    - We forget our self-consciousness; afterwards, we generally emerge with a stronger self-concept.
    - Musician at one with harmony of the cosmos, athlete at one with the team, solo gamer empower by her strategies. The self expands through acts of self-forgetfulness.
- The Transformation of Time
    - Hours seem to pass by in minutes
    - Occasionally the reverse: ballet dancers describe how a difficult turn that takes less than a second stretches out for what seems like minutes.

- Experiences Becomes an End in Itself
  - When most of these conditions are present, we enjoy the activity that produces them. We seek the activity as an end in itself (autotelic).
  - Most thing in life we do to achieve a goal, not because we enjoy them (exotelic).
  - Art, music, sports, and games are usually autotelic.
- To make flow experiences, think about:
  - What skills does your target audience have?
  - How can you give your players clear, focused goals, meaningful choices, and discernible feedback?
  - How can you merge what a player is doing physically with what they need to be thinking about in the game?
  - How can you eliminate distractions and fear of failure; that is, how can you create a safe environment where players lose their sense of self-consciousness and focus only on the tasks at hand?
  - How can you make the game activity enjoyable as an end in itself?
- Play: The Nature of Play
  - Play can be thought of as freedom of movement within a more rigid structure.
  - The Promise of Play (documentary)
    - "Play is boisterous." "It's non-directed." "It's spontaneous." "It's not scripted." "Play is loud." "Not work." "It's physical." "It's fun." "An emotional state when you're having a good time." "Play actually is meaningless behavior. You do it for its intrinsic value to you, but play can have utility. That is, you end up developing skills, and those skills can then be used in other arenas." "I think play is one of the ways that we get a feel for the shape of the world." "Play is the central item in children's lives. It's like work is to grown-ups. They play to learn." "Play is child's work. It's all that young children do to learn about the world that they're in."
  - Helps us learn skills and acquire knowledge
  - Let us socialize
  - Assists in problem solving
  - Allows us to relax
  - Makes us see things differently
  - Not too serious (laughter and fun)
  - Somewhat serious (pushing boundaries and trying new things)
  - Children are experts
  - Not any one thing, but rather an approach to an activity
  - *Man, Play, and Games* by Roger Callais (1958) categorizes play according to two attributes:
    - Competitive play, Chance-based play, Make-believe play, Vertigo play
    - Free-form play, Rule-based play
- Play: Types of Players
  - Competitor
  - Explorer
  - Collector

    - Achiever
    - Joker
    - Artist
    - Director
    - Storyteller
    - Performer
    - Craftsman
    - …
    - **Exercise** 4.5: Player Types. Name a game that appeals to each type of player in the list. What type of player do you tend to be?
- Play: Levels of Engagement
    - Not all players need to participate at the same level.
    - Some people like to be spectators.
        - How many times have you sat and watched a friend or sibling play through a level?
    - Participant play is how we usually think of play.
    - Participants can experience transformational play.
        - Serious games try for this.
- **Premise** establishes the action of the game within a setting or metaphor.
    - Premise is a traditional element of drama.
    - Without it, many games would be too abstract for players to be emotionally invested.
        - Imagine you are a set of data, and you try to increase some values to win the analysis. Sounds boring, but this is most combat systems.
        - Connect players with dramatic premise: An elf with a bow and arrow!
    - In traditional drama, premise is established in the exposition.
        - Time and place, characters and relationships, status quo, objective, etc.
        - The **problem** is the event that upsets the status quo and creates the conflict.
        - The **point of attack** is the point at which the problem is introduced and the plot begins.
    - Premises from movies
        - Star Wars: Episode IV
            - Galaxy far, far away
                - Luke Skywalker wants to get away and join the rebellion, but is held back by responsibility and loyalty
                - Story begins when his uncle buys two droids carrying critical, secret information
        - Fellowship of the Ring
        - Die Hard
- Premises from games
    - Space Invaders
        - Set on a planet (earth?) under attack by aliens
        - You are an anonymous protagonist defending the planet from the invaders
        - Story begins when the first shot is fired
        - Don’t need the backstory to feel the tension of the steadily advancing aliens

    - Pitfall
    - Diablo
    - Myst
- Premise makes a game's formal system playable.
- Good premise unifies the formal and dramatic elements. This heightens the experience of players.
- **Characters** are the agents through whose actions a drama is told.
    - Protagonist is the main character.
    - The antagonist opposes the main character's attempts to solve the problem.
    - Characters can be:
        - major (significant impact) or minor
        - round (complex with well-defined traits and personality, or who undergoes a significant change) or flat (few traits and shallow personality)
    - Ask yourself when writing:
        - What does the character want?
        - What does the character need?
        - What does the audience/player hope?
        - What does the audience/player fear?
    - Unique to games: agency versus empathy.
        - Agency is the practical function of a character to serve as a representation of the player in the game.
        - Empathy is the potential for players to develop an emotional attachment to the character, to identify with their goals and, consequentially, the game objectives.
    - Free will versus player control
        - Mario is a pure agent: he does nothing without the player. Sonic tapped his foot!
        - The Sims!
    - Avatars are player-created characters.
    - Believable AI is the holy grail.
        - The Sims
        - Halo enemy and ally AI
        - Façade by Michael Mateas and Andrew Stern
    -
    - **Exercise** 4.7: Name three game characters that you find to be compelling. How are they brought to life? What allows you to identify with them? Are they rounded or flat, dynamic or static?
- Story
    - The outcome of a story must be uncertain (at least the first time we experience it) just like the outcome of a game.
    - The uncertainty in a film or a play is resolved by the author, while the uncertainty of a game is resolved by the players. Because of this, it is very difficult to integrate traditional storytelling methods into games.
    - Story in Games
        - backstory only (premise)

    - cutscenes between levels
    - branching story lines
        - Too hard to author, so player choices end up being restricted or simplistic.
    - emergent Story
        - Black and White
        - Half-Life
        - Halo 2
    - **Exercise** 4.8: Pick a game that you feel successfully melds its story line with the gameplay. Why does this game succeed? How does the plot unfold as the game progresses?
- World Building
    - The deep and intricate design of a fictional world
        - maps
        - histories
        - cultural studies (language, government, politics, economies)
    - Examples:
        - J.R.R. Tolkien's Middle Earth
        - The Star Wars universe
        - World of Warcraft
- The Dramatic Arc
    - Conflict is at the heart of drama and game systems.
    - Meaningful conflict both keeps players from accomplishing their goals too easily AND draws players in emotionally by creating a sense of tension as to the outcome.
    - In traditional drama, conflict occurs when the protagonist faces a problem or obstacle that keeps her from accomplishing her goal.
    - Categories of traditional dramatic conflict:
        - character versus character
        - character versus nature
        - character versus machine
        - character versus self
        - character versus society
        - character versus fate
    - As game designers, we also have:
        - player versus player
        - player versus game system
        - player versus multiple players
        - team versus team
        - etc.
    - Thinking about game conflict in this way helps you to integrate the dramatic premise with the formal gameplay system.
- A conflict set in motion must escalate.
- Escalating conflict creates tension.
- Tension gets worse before it gets better.

- A classic dramatic arc:
  - Stories begin with exposition, which introduces the setting, characters, and important concepts
  - Conflict is introduced when the protagonist has a goal that is opposed by their environment, antagonist, or both.
  - The conflict and protagonist's attempt to resolve it cause a series of events that lead to rising action.
  - Rising action leads to a climax, in which some sort of deciding factor or event is introduced; what happens determines the outcome of the drama.
  - The climax is followed by a period of falling action in which the conflict begins to resolve.
  - The conflict is finally resolved during the resolution or dénouement.
- Jaws:
  - Protagonist: Sheriff Brody
  - Goal: Keep people of Amity safe
  - Antagonist: Shark
  - Conflict: Brody vs. Shark, Brody vs. self (fear of water)
  - Rising action: Brody keeps people out of the water. Shark attacks more people. Shark threatens Brody's children. Brody must face his fear and hunt the shark on the water.
  - Climax: Shark attacks brody.
  - Resolution: Brody kills the shark and returns the story to the status quo.
- In a game, the rising action is linked to both the formal and dramatic systems, because games get more difficult as they progress.
- Donkey Kong:
  - Protagonist: Mario (Jump Man)
  - Goal: Rescue Pauline before time runs out
  - Antagonist: Donkey Kong
  - Conflict: Climb building while avoiding barrels, etc.
  - Rising action: Each time Mario reaches Pauline, Donkey Kong grabs her and takes her to a higher, more difficult level.
  - Climax: Mario fights Donkey Kong directly by removing rivets.
  - Resolution: Donkey Kong falls and is knocked out; Mario rescues Pauline.
- Jaws has more developed characters and story than Donkey Kong.
- Brody must overcome his fear.
- Brody's motivation changes (save Amity, save his children, save himself).
- Mario has no internal conflict. Mario's motivation never changes. Pauline's danger doesn't increase.
- Mario has something Brody doesn't: his success or failure rests in the hands of the player.
- We the players figure out how to resolve the tension.
- We the players feel personal accomplishment on top of sympathy for reunion of Mario and Pauline.
- Conclusion

- The elements of drama we looked at form the basis of a tool set for game designers to elicit powerful emotional reactions from players.
  - challenge
  - play
  - integration of premise, characters, and story
- The emotional impact of games still has not achieved the depths it is capable of!

- Chapter 5: System Dynamics
  - A **system** is a set of interacting elements that form an integrated whole with a common goal or purpose.
    - Ludwig von Bertalanffy, a biologist, proposed in the 1940's that systems can be studied across a wide variety of disciplines.
  - Basic elements of a system: **objects, properties, behaviors, relationships**
  - Systems exist wherever we see complex behavior emerging from the interaction between discrete elements, throughout the natural and human-made world.
    - mechanical, biological, social, …
    - a stapler (simple), a government (complex).
  - When the system is put in motion, its elements interact to produce the desired goal.
  - **Objects** are the basic building blocks of a system. Systems can be thought of as a group of interrelated pieces called objects, which can be physical, abstract, or both, depending on the nature of the system.
    - Examples:
      - game pieces
      - in-game concepts
      - players
      - squares on a grid board
      - yard lines
    - Objects are defined by their properties and behaviors, and their relationships with other objects.
  - **Properties** are qualities or attributes that define physical or conceptual aspects of objects.
    - A set of values that describe an object.
    - Chess piece: rank, color, location.
  - **Exercise** 5.1: Objects and Properties: Choose a board game you have. Make a list of all objects and their properties.
  - **Behaviors** are the potential actions that an object might perform in a given state.
    - In chess, a bishop can move along the diagonals until blocked or capturing another piece.
    - The the more potential behaviors an object has, the less predictable its actions within the system.
    - Doesn't necessarily add more fun, though.
  - **Exercise** 5.2: Behaviors: Describe the behaviors of each object from Exercise 5.1. Consider all game states.
  - **Relationships** describe how objects are related to each other.
    - Without relationships, we have a collection of objects, not a system.
    - Consider a stack of blank index cards. If we write numbers on them, they suddenly have a relationship!
    - Can be based on location, ordinal (e.g. numbers), hierarchical (e.g. taxonomy), fixed (e.g. if based no a numerical value that never changes) or dynamic (e.g. if based on location and objects can move).
    - Examples:

    - Monopoly: The progression of spaces is a fixed, linear relationship that constraints play.
    - The Sims: Relationship are based on characters' needs and objects' abilities to fulfill those needs.
    - Relationships
    - Changes in relationship can be based on player choices or chance.
    - In WarCraft II, units have Hit Points, Armor, Basic Damage, Piercing Damage.
    - When attacking: random(.5,1) * (Basic Damage - Target's Armor) + Piercing Damage
    - Ogre kills Footman in ~8 swings. Footman needs at least 18 swings; will never win.
- **Exercise** 5.3: Describe the relationships between the objects from Exercise 5.1 and 5.2. How are they defined?
- System Dynamics
    - Elements of a system don't work in isolation from each other.
    - What if WarCraft II attack damage was purely random? Would you care about upgrades? Purely deterministic?
    - Systems are greater than the sum of their parts. We must study their elements in relation to each other.
    - This is why game design is hard; systems are too complex to directly determine how the rules will play out.
    - System Dynamics: Tic-tac-toe
        - Objects: the spaces on the board
        - Properties: "null", "x", or "o"
        - Relationships: relative location
        - Possibility tree:
            - On the first move, there is only center, corner, or side (the rest are rotations)
            - On the second move, 2–5 choices
        - Small number of objects with small number of properties and relationships: simple game
    - System Dynamics: Chess
        - Objects: Six types of units plus 64 unique spaces
        - Units' properties: color, rank, location, behaviors
        - Relationships: relative location
        - Possibility tree grows incredibly large incredibly fast!
        - Successful strategy relies on calling solutions from memories of previously played games
        - Vast number of possible outcomes due to varied behaviors of objects and their changing relationships.
- A game presents a sense of possibility.
    - More is not always better. You can have interesting gameplay with a constrained set of possibilities.
    - Set
        - Marsh Falco in 1988. Do German Shepherds inherit epilepsy?

    - Build a system complex enough to delight and surprise your players but not to confound or frustrate them.
- Linear:
    - Trivial Pursuit, side-scrollers (e.g. Super Mario Bros.)
- Branching:
    - Story-based adventure games (often have a limited number of outcomes)
- Open-ended, typically with lots of objects:
    - Simulation games (e.g. The Sims), massively multiplayer worlds, real-time strategy games
- Mastermind vs. Clue
    - Both have puzzle-breaking objective.
    - Mastermind has two roles, puzzle-maker and puzzle-breaker.
    - Clue has very different procedural and dramatic elements resulting in a very different player experience. No special roles.
    - Mastermind has 6^4 = 1296 possibilities; increasing the number of colors or pegs could make the game unplayable.
    - Clue has 6x6x9 = 324 possibilities, but must roll dice (chance) to gather evidence. Randomness often makes games more accessible.
- **Exercise** 5.4: System Dynamics
    - Take the game from Exercises 5.1, 5.2, and 5.3, and change the system dynamics (properties, behaviors, or relationships). For example:
        - In Monopoly, significantly change the prices, placement, and rent of every property. Or, significantly change the rules for movement.
    - Play the game. Is it still playable? Is it still balanced?
    - If it's still playable, make another change.
    - Repeat until the game is no longer playable.
    - What was the change that finally broke the game? Why?
- An **economy** is when a game allows for the exchange of resources, either with the system (i.e. the bank in Monopoly) or among players.
    - Must have
        - items of exchange, such as resources
        - agents of exchange, such as players or the system bank
        - methods of exchange, such as markets or other trading opportunities
    - May or may not have currency.
    - Questions designers should ask:
        - Does the size of the economy grow? For example, are resources produced? Is the growth controlled?
        - If there is a currency, how is the supply controlled?
        - How are prices set? Are they controlled by market forces or set by the game system?
        - Are there restrictions on opportunities for trade (by turn, time, cost, etc.)?
    - Simply Bartering: card game Pit
        - Amount of product: fixed
        - Money supply: n/a

        - Prices: fixed
        - Trading opportunities: not restricted
    - Complex Bartering: Settlers of Catan
        - Amount of product: controlled growth
        - Money supply: n/a
        - Prices: market value with cap
        - Trading opportunities: restricted by turn
    - Simple Market: Monopoly
        - Amount of product: fixed
        - Money supply: controlled growth
        - Prices: market value
        - Trading opportunities: not restricted
    - Complex Market: Ultima Online or EverQuest
        - Amount of product: controlled growth
        - Money supply: controlled growth
        - Prices: market value with base
        - Trading opportunities: not restricted
    - Metaeconomy: Magic: The Gathering
        - Amount of product: controlled growth
        - Money supply: n/a
        - Prices: market value
        - Trading opportunities: not restricted
    - Economies have the potential to transform rudimentary games into complex systems. You can use them as a way to get players to interact with one another.
- Emergent Systems
    - Games can have simple designs and yet display complex and unpredictable results when set in motion.
    - Emergence occurs when very simple rule sets, when set in motion, beget unpredictable results.
    - Examples:
        - Ants
        - John Conway's Game of Life
    - Games can employ emergent techniques to make believable and unpredictable scenarios.
    - Examples:
        - Halo
        - The Sims
- Interacting with Systems
    - Games are designed for player interaction. The structure of a game system is tied to the nature of the interaction. Consider:
        - How much information do players have about the state of the system?
        - What aspects of the system do players control?
        - How is that control structured?

    - What type of feedback does the system give the players?
    - How does this affect the gameplay?
  - Interacting with Systems: Information Structure
    - In an **open information** structure, players have complete information about the game state.
      - Example: Chess, Go.
      - Emphasizes knowledge and calculation-based strategy.
    - In a **hidden information** structure, players do not receive full information.
      - Example: 5-card stud poker
      - Allows for guessing, bluffing, and deceiving.
    - **Exercise** 5.6: Change an open information structure game to have hidden information. How does strategy change?
    - Many games use a mixture of open and hidden information.
      - 7-card stud poker (some cards are dealt shown, some are dealt hidden)
      - Blackjack
    - Players may receive information from their opponents when they interactive with them (**dynamic information** structures).
      - Real-time strategy games have "fog of war", which provides dynamically changing information (information about nearby enemies is shown and freezes if a player moves his or her units farther away)
        - Balances between strategy based on knowledge and strategy based on cunning.
    - **Exercise** 5.7: Information Structure. What type on information structures are present in Unreal Tournament, Age of Empires, Jak II, Madden 2008, Lemmings, Scrabble, Mastermind, and Clue? Do they have open, hidden, mixed, or dynamic information structures? If you do not know one of the games, pick a game that we have not mentioned and substitute it.
- Interacting with Systems: Control
  - Controls are related to a game's physical design.
    - Direct manipulation of board or card games
    - Keyboard, mouse, joystick for computer games
  - Properties of control systems:
    - **Direct control** over game elements, such as a first-person shooter, versus **Indirect control** over game elements, such as SimCity or Rollercoaster Tycoon
    - **Real-time control**, such as WarCraft, versus **Turn-based control**, such as Chess
  - Control is a very important design decision.
  - Control involves the **core mechanic**, a repetitive process or action performed throughout a game.
    - Players may stop playing a game with difficult, unintuitive, or not enjoyable actions.
      - Example: Text entry games aren't popular on (keyboard-less) consoles
  - Consider how to restrict control, since you want to design a challenge.
  - In WarCraft III, what if you didn't assign tasks to units, and instead the game always assigned 50% to mining gold and 50% to chopping trees? What if the player just specified the ratio?

- Interacting with Systems: Feedback
  - In system terms, **feedback** implies a direct relationship between the output of an interaction and a change to another system element.
    - **Positive** aka **reinforcing** (scoring a point gives a player an extra turn) or **negative** aka **balancing** (scoring a point means ending the turn)
    - In reinforcing relationships, a change to one element directly causes a change to another element in the same direction; forces the system toward an extreme.
    - In balancing relationships, a change to one element causes a change to another in the opposite direction; forces the system toward equilibrium.
  - Example: Jeapardy!
    - When a player answers a question correctly, they retain control (reinforcing relationship).
    - If a player who answered incorrectly were forced to sit out the next question, it would also be a reinforcing relationship.
  - Example: Football
    - When one team scores, the ball is given to the other team (balancing).
  - Example: Settlers of Catan
    - When a seven is rolled, any player with more than seven cards must give up half of them (balancing).
  - In games, you want an eventual unequal outcome, which reinforcing loops help achieve.
  - To keep the game from resolving too quickly, you can also use a balancing relationship.
- Tuning Game Systems
  - The only way to fully understand a system is to study it as a whole.
  - Game designers must playtest. First play your game yourself (bonus: with other designers!), and then play with other players.
  - 1. Make sure the system is internally complete.
    - Address any loopholes that arise.
    - Not internally complete games have “dead ends” that don’t resolve or players arguing over the rules.
  - 2. Test for fairness and balance.
    - All players should have an equal opportunity to achieve the goals.
    - Beware of dominant strategies or overpowered objects, which reduce meaningful choices.
  - 3. Test to make sure the game is fun and challenging.
    - Have clear player experience goals.
    - Test with the intended audience.
- Conclusion
  - We looked at the basic elements of a game system and saw how the objects, properties, behaviors, and relationships create different dynamics of interaction, change, and growth.
  - We looked at how player interaction with these system elements are affected by information, control, and feedback.

- A challenge when designing and tuning game systems is isolating which objects or relationships are causing problems, and how to modify them to fix the issue.
- It is the job of the game designer to create the perfect blend of elements that, when set in motion, produce the varieties of gameplay that bring players back time and again.

Part Two: Designing a Game

- Conceptualization
- Prototyping
- Digital Prototyping
- Playtesting

Chapter 6: Conceptualization

- **Conceptualization**: coming up with ideas for your games
- Great ideas come from great input into your mind and senses.
  - Live a full life: people, places, thoughts, events.
  - Will Wright: ant farms
  - Shigeru Miyamoto: exploration
  - Do something other than play games: read a book or newspaper, watch a movie or play, listen to music, take a photo, exercise, draw or sketch, volunteer, study a language
- Mihaly Csikszentmihalyi's stages of creativity:
  - **Preparation** is becoming immersed in a topic or domain of interest, a set of problematic issues.
  - **Incubation** is a period of time in which ideas "churn around" below the threshold of consciousness.
  - **Insight** is sometimes called the "aha!" moment, when the pieces of puzzle, or an idea, fall together.
  - **Evaluation** is when the person decides whether the insight is valuable and worth pursuing. Is the idea really original?
  - **Elaboration** is the longest part of the creative process; it takes the most time and is the hardest. This is what Edison meant when he said invention is 99% perspiration and 1% inspiration.
  - These stages:
    - Won't proceed linearly or regularly.
    - Doing something other than games is preparation and incubation.
- **Exercise** 6.1: Below the Surface. Take the subject of the last book or newspaper article you read and think of its systematic aspects. Are there objectives? Rules? Procedures? Resources? Conflict? Skills to be learned? Make a list of the systematic elements of the subject or activity. Do this several times per week with different types of activities or hobbies.
- Analyze games you play (your game journal).
  - Formal, dramatic, and dynamic elements.
  - Emotional responses.
  - Game deconstruction salons
  - **Exercise** 6.2: Game Deconstruction. Take one of the games you have analyzed in your game journal and create a "game deconstruction" presentation. Analyze the formal, dramatic, and dynamic elements of the game. Include a detailed walkthrough of several game sections that back up your analysis. If you can, create a PowerPoint

presentation from your analysis and organize an opportunity to present this to an appropriate audience. Lead a discussion of your ideas following the presentation.

- Analyze board games (www.funagain.com or www.boardgames.com)
  - They have innovative and complex mechanics
  - The mechanics aren't hidden in code
  - Settlers of Catan, Carcassonne, Scotland Yard, El Grande, Modern Art, Illuminati, Puerto Rico, Acquire, Cosmic Encounter, I'm the Boss
- **Exercise** 6.3: Board Game Analysis. Choose one of the games listed above and play it with a group of friends. Write your analysis of the formal, dramatic, and dynamic elements of the game in your game journal. Now find another group of players who have not played the game before. Have them play the game while you watch and take notes. Do not help them learn the rules. Note the steps of their group learning process as well as their impressions of the game in your analysis.

- Brainstorming Best Practices
  - Brainstorming is a skill. You can get better with practice. Here are best practices from Disney Imagineers, IDEO, and others.
    - State a challenge. Articulate it well. For games, you may want to think in terms of player experience goals.
    - No criticism. Write down all of your ideas and then criticize later. Join a conversation with "Yes, and …"
    - Vary the method. Don't rely on one method. Ask team members to suggest alternative ways of conducting the brainstorming session. Let them lead it.
    - Playful environment. Get out of your normal working area. Bring toys.
    - Put it on the wall. Get people on their feet. Make sketches and write side notes.
    - Go for lots of ideas. Go for quantity. Try for 100 in an hour. Number them. Don't filter them.
    - Don't go too long. Don't go longer than an hour.
    - +1 Brainstorm alone. If working in a group, it can help for each member to brainstorm alone, and then merge the lists of ideas anonymously.
  - **Exercise** 6.4: Blue Sky Brainstorm. Use the brainstorming techniques to brainstorm for a "blue sky" project. By blue sky, we mean that we know this project could not technically be made today, but we are going to pretend it could. The challenge is to come up with ideas for a "remote control" for a character from this list (choose one):
    - Door to door salesman
    - Busy mother
    - God
    - Superhero
    - Politician
    - First, brainstorm about the character: What does the character do? What makes the character interesting? What aspect of the character would it be engaging to control? How does the character react? Does the character have free will? Next, brainstorm features for your imaginary controller. What will it look like? What could each button

do? Remember, this is “blue sky,” so the buttons can do crazy things. Have fun with this! Come up with as many ideas as you can.

- **We haven’t covered beyond this line**

- Alternate Methods
  - Varying your brainstorming approach:
    - List Creation: List everything you can think of on a topic. Then create lists on variations of that topic.
    - Idea Cards: Write a single idea on each index card. Mix them up in a bowl and take them out in pairs or triplets or fours to make a combined idea.
    - Mind Map: A 2D arrangement of ideas. Put your core idea in the center. Let related ideas radiate outward, connected by different colored lines. For example, write your game’s core concept at the center, and then map verbs or actions and feelings associated with those actions around the central concept.
    - Stream of Consciousness: For 10 minutes, write anything that comes to mind. Do not worry about: being coherent, punctuation, spelling. Write as quickly as possible.
    - Shout It Out: Turn on a voice recorder and shout whatever comes into your head, like stream of consciousness. After five minutes, stop & transcribe.
    - Cut It Up: Open a newspaper or magazine to any page, and cut random words and images out of it. Once you have a pile of pieces, play with them and arrange them and try to come up with a game concept. You can use random web page searches, a dictionary, or the phone book.
    - Surrealist Games: Exquisite Corpse
      - **Exercise** 6.5: Exquisite Corpse. This version of the game is played with words. Everyone writes an article and an adjective on a piece of paper, then folds it to conceal the words and passes it to their neighbor. Now everyone writes a noun on the paper they are holding, folds it again to conceal their word, and passes it to their neighbor. Repeat with a verb; repeat with another article and adjective; finally, repeat with a noun. Everyone unfolds their papers and reads the poems they are holding aloud. One of the first poems written this way was, “The exquisite corpse shall drink the new wine,” which is how the game gets its name.
    - Research: Do research into a subject that interests you. Immerse yourself in the subject your game is about. Read about squid, collect butterflies, go fishing, study your target audience.
- **Exercise** 6.6: Do It. Now it is time to brainstorm your own idea. Get a potential team together—either in class or a group of friends who are interested on working on a game with you. If you cannot get a group together, do it on your own. As we did in Exercise 6.4 in the blue sky brainstorm, state an interesting challenge for your game, set up a whiteboard or a sheet of butcher paper, and use the techniques previously discussed to generate 100 ideas related to your challenge in 60 minutes. This might sound like a lot, but if you can keep the energy level up, you can do it!

- Editing and Refining
  - After brainstorming, you now have ideas but no game. Edit and refine the ideas.
  - Csikszentmihalyi's **Evaluation** stage, where you decide if an idea is valuable and worth pursuing.
  - Why remove an idea from your final list?
    - Technical Feasibility: it can't be done by you (now)
    - Market Opportunity: no market opportunity (now)
    - Artistic Considerations: you don't love it
    - Business/Cost Restrictions: too expensive, too large, not enough time
  - Keep the cut ideas somewhere for later.
  - Edit and brainstorm on different days. Don't mix them!
  - 1. Discuss the top five-to-ten favorite ideas thoroughly.
    - Stay positive.
    - Talk about relative strengths in terms of the four criteria from the previous slide (technically feasible, marketable, artistically interesting, in your scope).
  - 2. Narrow down to three ideas.
  - 3. Brainstorm again to flesh each idea out. Clearly define the features and the creative center (what EA calls the "X" of the game) of the game. The "X" has two parts:
    - The **razor**, which is the high concept ("GoldenEye set in WWII"), allows you to cut things that aren't essential.
    - The **slogan** drives the creative process ("Prepare for your finest hour.").
  - 4. Once you have your features and your X, write up one-page descriptions of your games. Refine your concept by talking to potential players.
  - **Exercise** 6.7: Describe Your Game. In one or two paragraphs, describe the essence of your game idea. Try to capture what makes it interesting to you and how the basic gameplay will work. State your "X"—both razor and slogan—as a part of your game description.
- Turning Ideas Into a Game
  - Don't adopt a pre-existing genre.
  - Ask yourself how you would like your players to act and feel (**player experience goals**).
    - Come up with a list of game verbs as described in the mind mapping method.
    - What is the role of the player?
    - Does the player have a clearly defined goal?
    - What are the obstacles in getting to that goal?
    - What kind of resources do they have to accomplish that goal?
  - The game mechanics should stem from the core idea.
  - Refer to formal, dramatic, and dynamic elements of game design. Learn from analyzing other games.
  - Don't get distracted by dramatic elements.
  - Focus on the formal elements (the system and mechanics). Ask yourself:
    - What is the conflict in my game?

        - What are the rules and procedures?
        - What actions do the players take and when?
        - Are there turns? How do they work?
        - How many players can play?
        - How long does a game take to resolve?
        - What is the working title?
        - Who is the target audience?
        - What platform will this game run on?
        - What restrictions or opportunities does that environment have?
    - To flesh out the game structure:
        - Define each player's goal.
        - What does a player need to do to win?
        - Write down the single most important type of player action in the game.
        - Describe how this functions.
        - Write down the procedures and rules in outline format.
        - Only focus on the most critical rules.
        - Leave all other rules until later.
        - Map out how a typical turn works. Using a flowchart is the most effective way to visualize this.
        - Define how many players can play.
        - How do these players interact with one another?
    - This is the start of prototyping!
    - The goal at this point is to have an outline of where your game is headed in the form of a written treatment and a sense of the game mechanics.
        - Each time gets easier.
    - **Exercise** 6.8: Write a Treatment. Take the description you wrote in Exercise 6.7 and expand it into a three- to five-page treatment for your game idea. Ask yourself questions about the formal and dramatic elements as you write. Remember that this is just a draft. When we go on to the prototyping stage, we will address these questions again in more detail.
- Feature Design
    - You can practice coming up with game ideas by designing new features for existing games.
        - Battlefield 2: Stealth Pack. Fast, camouflaged unit that is deadly at close range. Special missions like "rescue the diplomat" or "disable the radio tower".
        - Karaoke Revolution: World Party. Players record performances with an EyeToy and upload them to the internet. Highly rated performers move up.
        - Good for your portfolio! Entry level designers do this in industry.
    - **Exercise** 6.9: Feature Design Exercise, Part 1
        - Think of a feature you would like to see added to one of your favorite games. We are sure you have plenty of ideas on this one. It does not matter how far-fetched or technically difficult the idea is at first because you are not going to actually build it. Rather, you are going to illustrate how it works using storyboards and words.

- Feature Storyboards
  - Visualize feature ideas using an image editing program (Photoshop). Edit screenshots to explain what the player sees with your new feature ideas.
  - Make a series of still images, each slightly different than the last, to simulate what a player sees as they move through the game using the feature.
  - Assemble the images and add some explanatory text (PowerPoint).
  - This is an exercise in effective communication. It forces you to think through the hard problems.
    - An idea is a loose concept. A design is a detailed execution of the idea. Translating ideas into designs is an invaluable skill for a professional game designer.
- **Exercise** 6.9: Feature Design Exercise, Part 2
  - Create a visual storyboard stepping through the use of the feature idea you came up with for Exercise 6.9. Assemble the storyboard so that it tells a visual story of a player successfully playing the game. For example, the storyboard for Karaoke Revolution World Party could show all of the interfaces as if a player starts as a beginner and moves all the way to winning a prize. Present your idea to an appropriate group of people for critique, such as classmates or a game design club.
- Conclusion
  - Our goal is to enable you to go beyond borrowing elements from successful games and begin innovating.
  - Break conventions and experiment with novel types of gameplay.
  - Sometimes limiting yourself to primitive technology helps you focus your ideas.
  - Now let's see if those ideas work.
  - Onward to prototyping and playtesting!