

The Playcentric Primer

Every assigned reading from Tracy Fullerton's *Game Design Workshop* (Intro, Chapters 1–7, 9, and 12) plus the *Reality is Broken* excerpt, broken into short lessons you can actually finish. Read a block, check yourself, move on. Quiz answers are marked with a check so you can cover them and test yourself. Profiles of every designer mentioned are in the People to Know appendix.

Textbook: Game Design Workshop, 4th ed. **Author:** Tracy Fullerton (USC Games)

Pages covered: xxxi–xxxiii, 1–239, 277–309, 391–421

DUE MON 9/14

Intro + Chapter 1 (with Playful Production Process intro)

DUE WED 9/16

Chapters 2 + 3 (with Reality is Broken pp. 34–48)

DUE MON 9/21

Chapters 4 + 5 · Flash 2: Dramatic Elements & Systems

DUE MON 9/28

Chapters 6 + 7 · Flash 4: Putting it All Together

DUE WED 10/7

Chapter 9 · Analog Adaptations workday

DUE MON 11/9

Chapter 12 · Collaboration for Ideation

INTRODUCTION • PAGES XXXI–XXXIII, PLUS THE PART 1 OPENER ON PAGE 1

Why this book makes you build games instead of just reading about them

About 6 minutes 3 lessons · 3 check questions

BIG IDEA

The only way to become a game designer is to make games. This book is a set of exercises, not a text to memorize.

LESSON 1

What a game designer actually does

Fullerton opens with a quote from psychologist C.G. Jung: inventing good games is one of the hardest things people can do. Her definition of the job is worth memorizing, because the whole course flows from it:

"Part engineer, part entertainer, part mathematician, and part social director, the role of the game designer is to craft a set of rules within which there are means and motivation to play."

Fullerton, Introduction

Notice the two halves: **means** (what players can do) and **motivation** (why they want to). Rules alone are not a game. A designer builds the conditions for that thing players just call "fun": some mix of challenge, competition, and interaction.

She also frames games as ancient. Digital games are just the newest expression of something every human culture has done. That matters because the appeal of games was never about technology. It comes from the **experience of the players**.

LESSON 2

Why games matter now (the numbers she cites)

- U.S. game industry revenue reached about \$36 billion in 2017, more than the domestic movie box office.
- 97% of American teens play games; nearly a third play every day.
- The average game player is 35 years old, so this is not a kids-only medium.
- Over 400 game design programs exist worldwide. Interest in game design as a career is exploding the way screenwriting did when film grew up.

Fullerton's credentials: she designed games for Microsoft, Sony, MTV, and Disney, then spent 20+ years building the USC game design program. Her students made *flOw*, *Flower*, and *Journey* (thatgamecompany) and worked on *League of Legends*, *Bioshock 2*, and *What Remains of Edith Finch*.

LESSON 3

Her method: three steps, and no code at first

Her approach is "exercise driven and extremely nontechnical." She does **not** want you building your ideas in software right away. Why? Because the complexity of software hides the structure of your game from you. Paper, index cards, and acting things out let you see what works and what doesn't.

STEP	WHAT YOU LEARN	WHERE IN THE BOOK
1. Understand how games work	Rules, procedures, objectives. What is a game? What makes one compelling?	Part I (this is where you are now)
2. Conceptualize, prototype, playtest	Build rough physical or digital prototypes, put them in players' hands, revise from feedback	Part II
3. Understand the industry	Where the designer fits on a team and in the business	Part III

The three most important skills in game design, in her words: **prototyping, playtesting, and revising** your system based on player feedback.

The Part 1 opener adds one more idea. We play games to learn skills, feel achievement, connect with friends and family, and sometimes just pass time. Her advice: ask yourself why *you* play. Understanding your own answer is step one. She calls her whole approach **playcentric**: design for the player's experience no matter what platform you build on.

Check yourself

answer key marked with ✓

Why does Fullerton tell you NOT to build your first design in software?

Software is too expensive for students

✓ **Software complexity hides the structure of your game so you can't see what's working**

Digital games are less fun than board games

Why: Paper prototypes strip away code, art, and tech so you can see the system itself. You'll build in software later, once the core works.

Which of these is the designer's job, according to the Introduction?

Write the story and design the characters

Program the engine and manage the budget

✓ **Craft a set of rules within which there are means and motivation to play**

Why: "Means and motivation to play" is the definition. Story and code are other people's jobs on a team.

What are the three most important game design skills she names?

✓ **Prototyping, playtesting, and revising**

Drawing, coding, and writing

Marketing, pitching, and publishing

Why: Everything else in the course hangs off this loop. Chapter 1 turns it into a full process.

The designer is the player's advocate, and the process is a loop

About 15 minutes · 6 lessons · 6 check questions

BIG IDEA

Your first job is to be an advocate for the player. You do that by setting player experience goals, prototyping on paper, playtesting early, and iterating until the experience matches the goals.

LESSON 1

Advocate for the player

A designer is like an architect drafting a blueprint or a screenwriter writing a script: you plan the **structural elements of a system** that, when players set it in motion, creates the experience. You create the objectives, rules, and procedures, and you think up the dramatic premise.

But the role "first and foremost" is to **see the game through the player's eyes**. It's easy to get seduced by graphics, story, or new features. Players may say they love the art, but they won't keep playing unless the **gameplay** hooks them. Let the art director worry about imagery, the producer about budget, the technical director about the engine. Your job is superior gameplay.

Why you need playtesters

When you start, your view of the game matches a new player's. After months of tweaking, you lose objectivity. **Playtesters** restore it. Watch where they look, where they touch the screen, when they get stuck or bored, and write down everything they say.

Fullerton lists the excuses designers use to skip playtesting (tight schedule, fear that feedback will force changes, cost, "only big companies do that") and says all of them cost time, money, and creative heartache in the end. Many designers who do

playtest only do it at the end of production, when it's too late to change the essential design.

Learning to listen to players means "gauging reactions, interpreting silent moments, studying feedback, and matching those with specific game elements." Chapter 9 covers how to run professional-quality playtests. For now: playtesting is the heart of the whole process. Like any living system, a game transforms during development. No rule is set in stone; no technique is absolute.

The party host metaphor

Designing a game is like hosting a party. You set out food, music, and decorations, then open the doors and see what happens. The party isn't real until the guests arrive. A game, likewise, is only fully realized when players participate. Game design is not one-way communication.

"It's not locking things in place; it's giving birth and parenting."

Fullerton on the art of game design

EXERCISE 1.1 • BECOME A TESTER

Play a game and observe yourself. Write one page of notes on what you did and felt. Then watch a friend play the same game and take notes. Compare.

LESSON 2

Passions and skills a designer needs

The one thread all great designers share: a **passion for games and play**. Testing your own game for the ten-thousandth time becomes work, and passion is what gets you through. On top of that:

Communication

The most important skill. You'll "sell" your game many times: to teammates, management, investors. Also means listening and compromising. Listening gives teammates a sense of authorship, and a rejected idea can spark one you do use. Her compromise example: a feature is technically impossible, the programmers offer an alternative that loses the essence, and you must adapt the idea "elegantly" so the gameplay survives.

Teamwork

Teams span programmers, artists, and executives who speak different professional languages. The designer is a "universal translator," making sure everyone is building the same game.

Process

Games are fragile systems; change one variable and ripples spread. Fixing one bug can create five. Good process (playtesting, controlled iterative changes) is what rescues a game from ending up D.O.A.

Inspiration

See the world as systems with rules, goals, and obstacles: money, dating, ant colonies. Will Wright turned ant colonies into SimAnt, the Gaia hypothesis into SimEarth, and Maslow's hierarchy into The Sims.

Becoming a better player

Develop "game literacy": play with conscious attention to your own experience and the underlying system, the way a musician develops an ear. Keep a **game journal**. Don't review features; dig into one meaningful moment and why it worked.

Creativity

Everyone's differs: some generate lots of ideas, some dig into one, some think alone, some bounce ideas off a group. Miyamoto's childhood hike to a hidden lake became the feeling of Zelda. You Don't Know Jack mashed Shakespeare with the Brady Bunch. Keita Takahashi was asked for a racing game and made Katamari Damacy instead. Fullerton's own game about Thoreau's time at Walden Pond took ten years and a deep commitment to a "strange" idea.

Why childhood is such rich material: kids are "particularly engrossed in playing games." They make games and learn social order through play, so your own childhood games are raw material.

Her closing point: "What matters is not the spark of an idea but what you do with that idea once it emerges." That's where process comes in.

EXERCISES 1.2 - 1.5

D.O.A.: pick a game that was dead on arrival and explain what the designers missed. **Your Life as a Game:** list five areas of your life that could be games. **Game Journal:** start one and write daily. **Your Childhood:** list ten childhood games and what made each compelling.

LESSON 3

Player experience goals (not features)

The playcentric process starts by bringing the player in as early as possible. The first way to do that is to set **player experience goals**: descriptions of the interesting situations you hope players find themselves in. They are **not features**. Her examples:

- "Players will have to cooperate to win, but the game will be structured so they can never trust each other."
- "Players will feel a sense of happiness and playfulness rather than competitiveness."
- "Players will have the freedom to pursue the goals of the game in any order they choose."

None of those say *how* the goal will be built. Features get brainstormed later, then playtested to see if they hit the goal. The hardest thing for a beginner is to see past features to what players are actually thinking and feeling as they make choices.

Prototype and playtest early

Right after brainstorming, build a **physical prototype** of the core mechanics: paper, pen, index cards, or even acting it out. Play it with friends and perfect it *before* a single programmer, producer, or artist joins. In the industry, testing core mechanics often happens late, and flaws get found too late to fix. Professional user researchers like Nicole Lazzaro (XEODesign) and Dennis Wixon (Microsoft) are becoming more important, especially for new, inexperienced players on phones and tablets, but you don't need a test lab to use the playcentric approach.

Her rule: **don't begin production without a deep understanding of your player experience goals and core mechanics.** Once production starts, changing the software design gets harder and harder.

LESSON 4

Iteration: the loop you'll use all semester

Iteration means you design, test, and evaluate over and over, improving each time, until the player experience meets your goals. Here's the loop:

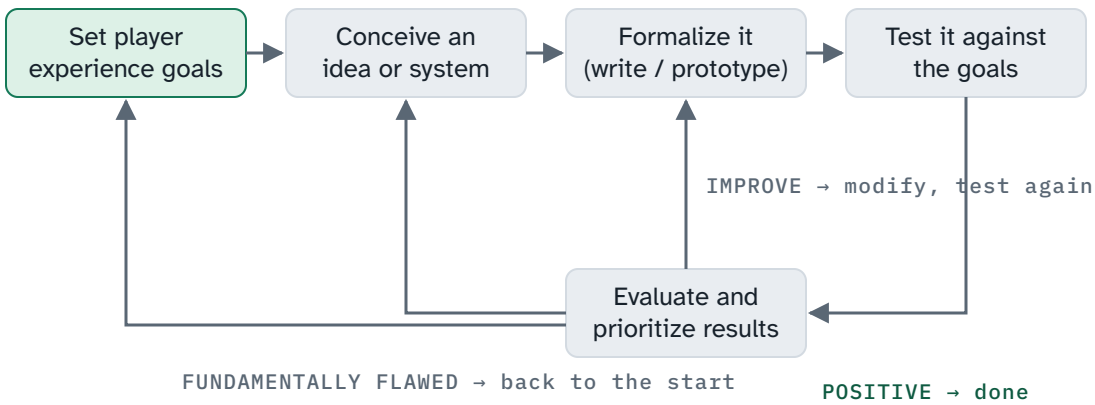


Figure 1.8 in the book. If results are negative and the idea is fundamentally flawed, go back to step one. If they point to improvements, modify and test again. If positive, you're finished with this loop.

This loop applies to everything from the first concept to final QA. The full process she lays out has seven steps:

STEP	WHAT HAPPENS	KEY OUTPUT
1. Brainstorming	Set experience goals, generate concepts, narrow to the top three	One-page treatment for each
2. Physical prototype	Pen-and-paper version; playtest it	3–6 page gameplay treatment once it works
3. Presentation (optional)	Pitch to secure funding or team buy-in	Demo art + gameplay treatment
4. Software prototype(s)	Rough digital models with cheap temporary graphics	Working core gameplay in code
5. Design documentation	Capture goals for the team; often a wiki, not a giant static doc	A living collaboration tool
6. Production	Full team, sprints, keep testing; changes should get smaller and smaller	The game
7. Quality assurance	Gameplay should already be solid; focus on usability and accessibility	Shippable build

Her warning on step 6: production is "when most game designers actually wind up designing their games," which causes the time, money, and frustration problems. Do the design work in steps 1–4.

Sidebar: Eric Zimmerman's SiSSYFiGHT 2000 case study

Zimmerman (co-author of *Rules of Play*) describes iterative design as "test, analyze, refine. And repeat." For the online game *SiSSYFiGHT 2000* (schoolgirls fighting for playground dominance), the team first defined **play values**, then built the very first version with **Post-it notes around a conference table**, with Zimmerman acting as the computer. Next came a text-only IRC version, then the real build. Beta testing revealed players turtled defensively, so they added a penalty for "cowering" twice in a row.

His key phrase: game design is a **second-order design problem**. Designers create rules, but players experience *play*, which only emerges when the rules are inhabited. That's why you can't script it in advance and must test.

LESSON 5

Prototypes in the industry, and designing for innovation

Many studios skip the physical prototype and go straight from concept to writing the design. That works only because most games are variations on existing mechanics, which makes them **derivative from the start**. Once programmers and artists are cranking, changing core gameplay becomes nearly impossible.

Electronic Arts built an in-house preproduction workshop around physical prototyping. Glenn Entis's advice: make it **"fast, cheap, public, and physical."** If the team isn't arguing over the prototype, they aren't sharing ideas. Smaller studios use **game jams** (like the Global Game Jam) to prototype fast.

By "innovation" she means: unique mechanics beyond existing genres, appealing to new players, new platforms (phones, VR, AR, gestures), games that integrate with daily life, new business models, and hard problems like integrating story and gameplay, deeper empathy for characters, and games for learning. Real innovation

"seldom comes from the first spark"; it comes from long-term experimentation with players.

LESSON 6

Designers you should know (and two perspectives)

The chapter has a sidebar of foundational designers. You don't need every detail, but recognize the names and their signature contribution:

DESIGNER	KNOWN FOR
<u>Shigeru Miyamoto</u>	Donkey Kong, Mario, Zelda, Pikmin. Added story and emotion to arcade play.
<u>Will Wright</u>	SimCity, The Sims, Spore. Games about creating, not destroying; no set goals.
<u>Sid Meier</u>	Civilization, Pirates! "Father of PC gaming."
<u>Warren Spector</u>	Deus Ex, System Shock, Thief. Free-form, player-authored gameplay.
<u>Brenda Romero</u>	Wizardry, Jagged Alliance, the analog series The Mechanic is the Message (see Ch. 3).
<u>Richard Garfield</u>	Magic: The Gathering. Invented the collectible card game.
<u>Amy Hennig</u>	Uncharted, Legacy of Kain. Cinematic game writing.
<u>Peter Molyneux</u>	Populous, Black & White. Pioneer of "god games."
<u>Gary Gygax</u>	Dungeons & Dragons, ancestor of every RPG.
<u>Richard Garriott</u>	Ultima series; Ultima Online pioneered MMOs.
<u>Dona Bailey</u>	Co-created Centipede; the only woman in Atari's coin-op division.
<u>Gerald Lawson</u>	Fairchild Channel F; invented the game cartridge.

Designer Perspective: Christina Norman (Riot Games, Mass Effect 2)

Became a designer at age 9 as a D&D dungeon master. Got into BioWare as a programmer after being rejected as a designer. Her rule: **"I don't build games for myself."** On *Mass Effect 2*, guns "worked" in the first game (an invisible die roll decided hits) but felt weak. She learned that **making something work is different from making it feel great**. Advice: play many games, watch other people play, listen to your team regardless of their job title.

Designer Perspective: Warren Spector (Deus Ex)

Started in board games at Steve Jackson Games, then TSR, then Origin. Influences: *Ultima IV* (choices with consequences), *Super Mario 64* (simple controls, deep play), *Ico* (holding a character's hand created real emotion). Games are "an experiential shoe store": they let you walk in anyone's shoes. Advice: learn to program, get a broad education, communicate well, and above all **make games**. "There's no room here for dilettantes!"

Check yourself

answer key marked with ✓

Which of these is a player experience goal rather than a feature?

The game has a crafting system with 40 recipes

✓ **Players must cooperate to win but can never fully trust each other**

The game supports four-player online co-op

Why: Experience goals describe what players feel or face, not what the game contains. Features come later and get tested against the goal.

The designer's role "first and foremost" is to be...

The team's lead programmer

The author of the story

✓ **An advocate for the player**

Why: Everything in the playcentric approach follows from seeing the game through the player's eyes.

In the iterative loop, what should you do if playtesting shows the idea is fundamentally flawed?

✓ **Go back to the first step and reconsider goals and concept**

Add more features to fix it

Ship it and patch later

Why: Improvements mean modify and retest. Fundamental flaws mean start over. That's cheap on paper and expensive in code.

Fullerton says the most important skill a designer can develop is...

Drawing concept art

✓ **Communicating clearly with everyone working on the game**

Winning at competitive games

Why: You have to "sell" the game to teammates, management, and investors, and also listen and compromise.

What was the first prototype of SiSSYFiGHT 2000?

A Flash build with placeholder art

A text-only IRC chat version

✓ **Post-it notes around a conference table with the designer acting as the computer**

Why: Post-its came first, then the IRC text version, then the real build. Paper before code.

Glenn Entis (EA) says a prototype should be...

✓ **Fast, cheap, public, and physical**

Polished, private, and digital

Detailed, documented, and final

Why: A physical prototype gets the team arguing and interacting, which is how ideas actually get shared.

What do Go Fish and Quake have in common? Everything that makes them games.

About 15 minutes 6 lessons · 7 check questions

BIG IDEA

All games share eight formal elements that give them structure, and dramatic elements that make players care. A game is a closed, formal system that engages players in structured conflict and resolves its uncertainty in an unequal outcome.

LESSON 1

The Go Fish vs. Quake comparison

Fullerton picks two games that could not look more different: a public-domain card game for 3–6 players, and a copyrighted 3D real-time shooter for one. Yet you'd call both games instantly. So what do they share? She walks through both descriptions and pulls out eight things they have in common. These are the **formal elements**: the structure without which a game stops being a game.

The two games as she describes them

Go Fish. Three to six players, standard 52-card deck. The dealer deals five cards each; the rest go face down in a draw pile. Player to the dealer's left starts. On your turn you ask a specific player for a specific rank ("Chris, please give me your Jacks"), and you must already hold at least one card of that rank. If Chris has any, he hands over all of them and you go again. If not, he says "Go fish!" and you draw. If you draw the rank you asked for, show it and go again; otherwise the turn passes to the player who said "Go fish." Four of a kind is a "book," shown and discarded face down. The game ends when someone runs out of cards or the draw pile is empty; most books wins.

Quake (single player). You control a character in a 3D world who can walk, run, jump, swim, shoot, and pick things up, with limited armor, health, and ammo.

Eight weapons (axe, shotgun, double-barreled shotgun, nail gun, perforator, grenade launcher, rocket launcher, thunderbolt), each tied to a specific ammo type. Power-ups boost, protect, heal, or make you invisible, invulnerable, or able to breathe underwater. Enemies range from rottweilers and grunts to shamblers; hazards include water, slime, lava, traps, and teleporters. The enemy Quake uses "slip-gates" to send death squads into your bases. Four episodes of five to eight levels each. Goal: stay alive and clear each level of enemies.

EXERCISE 2.1 • THINK OF A GAME

Describe one game in detail to someone who's never played anything like it. Then describe a completely different game. Compare: which elements were different, and which were the same underneath?

LESSON 2

The eight formal elements

ELEMENT	WHAT IT MEANS	GO FISH	QUAKE
<u>Players</u>	Voluntary participants who accept the rules and actively make decisions	3–6 players competing with each other	One player vs. the game system
<u>Objectives</u>	What players are trying to accomplish. Films and books give you no objective; games do	Make the most books of four	Stay alive, complete the level
<u>Procedures</u>	The actions or methods of play the rules allow. In digital games, the controls	Deal five, ask a player for a rank, draw	Walk, run, jump, swim, shoot, pick up
<u>Rules</u>	Define objects and concepts, limit behavior, prescribe what happens in situations	Cards go face down; you must hand over a requested Jack	Eight weapons; shells only fit shotguns

<u>Resources</u>	Objects with value because they are useful <i>and</i> scarce	Cards of each rank	Weapons, ammo, health, power-ups
<u>Conflict</u>	Rules and procedures keep you from reaching the goal directly	Ask one player at a time, risk losing your turn	Maze of enemies and hazards blocks the exit
<u>Boundaries</u>	The game's rules apply only inside the game, not in real life	Conceptual: the social agreement to play	Physical: the 3D level's walls in code
<u>Outcome</u>	Uncertain, but there will be a measurable, unequal result (winner, loser)	Most books wins	Survive or die

A few details from her walkthrough of each element:

- **Players.** What other entertainment demands active participation from its consumers? Musicians and actors participate, but music and theater are made for an audience. A player is a voluntary participant who both partakes in and consumes the entertainment: active, decision-making, invested, a potential winner.
- **Procedures** create interactions that would never happen outside the game. You'd never ask one player at a time for Jacks if you could search the deck. Following the inefficient procedure is exactly what confirms you're playing a game.
- **Rules** imply authority, yet no referee is named in either description. The authority comes from the players' implicit agreement to submit to the experience. Break the rules and "in a very real way, you are no longer playing the game."
- **Resources.** Go Fish uses direct exchange of resources between players; Quake's resources are fixed in place by the designer. Resources can be used, combined into new things, or bought and sold in markets.

Two ideas hiding inside "players" and "boundaries"

Lusory attitude (Bernard Suits): players voluntarily adopt rules that require "worse rather than better means" to reach an end. In golf, the efficient thing is to walk over

and drop the ball in the hole. Players instead hit it with a stick from 400 yards away, because they've accepted the rules. That acceptance is part of the player's psychology you design for.

The magic circle (Johan Huizinga, *Homo Ludens*): the temporary world where the game's rules apply instead of ordinary rules. "The arena, the card-table, the magic circle, the temple, the stage, the screen" are all "temporary worlds within the ordinary world."

Outcome vs. objective

These are different. Everyone can achieve the *objective* (make books), but other factors decide who *wins*. And uncertainty is what keeps people playing. If one player is so far ahead that the result is obvious, everyone agrees to quit. A chess player who sees she can't win concedes. Unlike a favorite movie, a game depends on not knowing the ending. Players invest emotion in that uncertainty, so crafting a satisfying, measurable, unequal resolution is the designer's job.

Why she calls them "formal"

Scholars from conflict studies, economics, psychology, sociology, and anthropology have all asked what games are; Salen and Zimmerman synthesize those views in *Rules of Play*. Fullerton's goal is not a definitive taxonomy but a shared vocabulary for the playcentric process. Understanding traditional structures also lets you **experiment with alternatives** (she points to the experimental game *Cloud*). Innovation may require going beyond these elements to the edges of what we call games.

EXERCISES 2.2 - 2.5

Players: how do players join a game of Go Fish vs. single-player Quake (social, procedural, technical steps)? Any similarities? **Objectives:** list five games and their objective in one sentence each. **Rules:** can you think of a game with no rules? One rule? Why is this hard? **Conflict:** compare how football and poker create conflict.

Engaging the player: the dramatic elements

Formal elements give structure, but what makes players *care*? Some players love pure abstract challenge, but most need an emotional connection. Fullerton introduces these **dramatic elements** here and goes deep on them in Chapter 4:

Challenge

Conflict creates tension. Rising challenge builds tension; too much causes frustration; flat or falling challenge causes boredom. Balancing this is key to keeping players engaged.

Play

Salen and Zimmerman define play as "free movement within a more rigid structure," like the play in a steering wheel. Rigid rules create room for imagination, fantasy, and free-form interaction. Play can be serious (a chess Grand Master match), charged and aggressive (a Quake tournament), or an outlet for fantasy (World of Warcraft, Guild Wars 2).

Premise

Context for the formal elements. Monopoly's premise (being a rich land-grabbing landlord) was appealing during the Great Depression and still is. Quake's is violent military imagery; World of Warcraft's is a fantasy world of archetypal quests. Premise makes choices easier to contextualize and involves players emotionally.

Character

An agent through which drama is told, and a vessel for the player's own participation, a "mask we create and direct." Role-playing and digital games made this tool possible; think of how Mario has evolved.

Story

Differs from premise because it has narrative: a premise doesn't have to go anywhere, but a story unfolds as the game progresses. The debate is ongoing: how much story is too much? Should gameplay change the story, or story dictate gameplay?

EXERCISES 2.6 – 2.8

Challenge: name three games you find particularly challenging and why.

Premise: what are the premises of Risk, Clue, Pit, and Guitar Hero (or games you know)? **Story:** has a game story ever gripped or moved you? Why or why not?

Sidebar: Scott Kim, "What is a Puzzle?"

Kim's favorite definition: **a puzzle is fun, and it has a right answer.** Fun comes from novelty, being "not too easy, not too hard," and trickiness. He borrows Chris Crawford's ladder of play activities, from most to least interactive:

- **Games:** rule-based, goal is winning against opposing players
- **Puzzles:** rule-based, goal is finding a solution; little replay value
- **Toys:** manipulable, no fixed goal (SimCity)
- **Stories:** fantasy, but can't be changed by the player

Examples on that ladder: SimCity is a toy players make puzzle-like by setting goals; Half-Life 2 is a shooter with some puzzles; Portal is a puzzle game on a shooter engine with integrated story; Boggle is a multiplayer game racing to solve a random puzzle. Solitaire is a borderline case: really a puzzle, since any given deal has a definite solution (or none).

Rule of thumb: to design a good puzzle, first build a good toy. Players enjoy manipulating Tetris blocks even before they understand the goal. He also separates **rule design** (inventing Rubik's Cube; harder) from **level design**

(composing one crossword). Puzzle design shares game design's goal: keep the player in a pleasurable, challenging state of flow. Fun is subjective, so tailor puzzles to your audience, and remember Bernie DeKoven's advice from *The Well-Played Game*: be willing to alter rules to keep the game fun for everyone. His exercise: invent a computer puzzle inspired by today's headline, build two levels, paper-prototype it, and test it.

LESSON 4

The sum of the parts, and the definition

Games are **systems**: groups of interrelated elements that form a complex whole. Like a car engine, you can understand every part, but you can't observe its real function (motion) until you turn it on. What emerges in play can't be predicted from the parts separately. Chapter 5 will cover this as "system dynamics."

Pulling it together, her working definition. Memorize the three parts:

A GAME IS

1. A closed, formal system, that
2. Engages players in structured conflict, and
3. Resolves its uncertainty in an unequal outcome.

Closed means there's an emotional boundary too: inside the game you might "slaughter your best friend," but outside it has no consequences. **Unequal outcome** means games aren't designed to prove we're all equal; they produce winners. (She notes *World of Warcraft* and *The Sims* stretch this, but still provide moments of resolution and measurable achievement.)

LESSON 5

Beyond definitions

Having built a definition, she immediately looks past it. Interesting design lives at the edges:

- **Serious games / games for learning:** *Darfur is Dying*, *September 12th*, *That Dragon*, *Cancer*. See the Games for Change festival.
- **Gamification:** badges for finishing a history project or running five miles. Fullerton is "not fond of the term" because it implies layering game features over anything makes it fun. Players see through shiny prizes; real engagement needs deeper system design.
- **Experimental and art games:** *Dear Esther*, *Renga* (100 players with laser pointers), her own *The Night Journey* with artist Bill Viola, and *Interference*. Venues: IndieCade and the Independent Games Festival.

Her stance on terminology: the lack of a shared vocabulary is one of the industry's biggest problems, so she uses these terms consistently. They're a launch pad, not a cage.

LESSON 6 • DO THIS ONE

Exercise 2.9: Play Sprouts, then take it apart

This is the exercise most likely to come up in class. You need paper, two pens, and a partner. The game (Conway and Paterson, 1967):

1. Draw three dots randomly on the paper.
2. Player one draws a line from one dot to another (a line may loop back to the same dot), then draws a new dot anywhere on that line.
3. Player two does the same. Constraints: no dot may have more than three lines coming out of it, and no line may cross another line.
4. Take turns until someone can't move. The last player who could move wins.

Now identify its formal elements: **Players** (how many, any requirements?), **Objective**, **Procedures**, **Rules**, **Conflict** (what causes it?), **Boundaries** (physical or conceptual?), **Outcome**. Then the dramatic ones: what creates **challenge**? Is there **play** within the rules? Is there any premise, character, or story, and what could you add? The Game Analyzer tab on this page has a worksheet for exactly this.

Designer Perspectives: Jane McGonigal and Randy Smith

Jane McGonigal wrote *Reality is Broken*, which is also on your reading list this week. She came from theater, designs games played in real spaces (*Cruel 2 B Kind*, *SuperBetter*), and does "Twitter virtual playtests": tweet a rule set and ask followers what strategy they'd adopt. Her Olympic labyrinth game was solved during yoga: players could *be* the walls. Advice: seek real-world positive impact with every game.

Randy Smith (*Thief*, Tiger Style's *Spider* and *Waking Mars*) cold-called Looking Glass Studios for his first job. Advice: "Don't do what everyone else is doing." Games "don't have to be fun, fair, balanced, clear, and certainly not 'addictive.'" They can have meaning like any art form.

Check yourself

answer key marked with ✓

Which list is the eight formal elements?

Story, character, premise, challenge, play, conflict, art, sound

Players, graphics, levels, controls, score, difficulty, story, ending

✓ **Players, objectives, procedures, rules, resources, conflict, boundaries, outcome**

Why: A memory hook: *P-O-P-R-R-C-B-O*. The first list is dramatic elements plus extras.

The "lusory attitude" is...

✓ **Voluntarily accepting rules that make you use less efficient means to reach a goal**

The feeling of losing a game

A designer's attitude toward playtesters

Why: Suits's golf example: you could drop the ball in the hole by hand, but you hit it with a stick because you accepted the rules.

What is the "magic circle"?

A power-up in Quake

✓ **Huizinga's term for the temporary world where the game's rules apply instead of ordinary rules**

The loop of prototyping and playtesting

Why: "Temporary worlds within the ordinary world, dedicated to the performance of an act apart."

How does a resource differ from any other game object?

It is always money

It is anything the player can pick up

✓ **It has utility (helps reach the goal) and scarcity (the designer limits it)**

Why: Both are required. Useful but unlimited isn't a resource; scarce but useless isn't either.

Fullerton's working definition of a game does NOT include which phrase?

Closed, formal system

✓ **Delivered through a screen**

Resolves its uncertainty in an unequal outcome

Why: Nothing about technology is in the definition. Go Fish qualifies just as much as Quake.

Why does Fullerton dislike the term "gamification"?

✓ It implies layering game features (badges, points) over anything makes it fun, which players quickly see through

She thinks games should never be educational

It is a trademark owned by a competitor

Why: She likes the impulse (playful engagement with important ideas) but says real engagement needs deeper system design.

In Scott Kim's terms, what is a puzzle?

A game with no rules

A toy with a story

✓ Something fun that has a right answer

Why: Fun makes it play; the right answer distinguishes it from games (winning) and toys (no goal).

Each formal element is a design lever. Pull one and the others move.

About 20 minutes 8 lessons • 8 check questions

BIG IDEA

Chapter 2 named the eight formal elements. Chapter 3 turns each one into a toolkit of choices: how many players and in what pattern, which kind of objective, what procedures and rules, which resources, where conflict comes from, how boundaries and outcomes work.

LESSON 1

Start by breaking a game

EXERCISE 3.1 • GIN RUMMY

Take away the discard procedure and try to play. Then take away drawing too. Then remove the objective. What's missing each time? The point: a game without players, an objective, rules, or procedures "is not a game at all."

Inside the magic circle, rules take on power. Bound by rules, we do things we'd never do (shoot, betray) and things we'd like to think we're capable of (courage, sacrifice, hard decisions). "Restrictive and binding statements," when set in motion, "mysteriously create the opportunity for play."

LESSON 2

Players: invitation, number, roles, and interaction patterns

Invitation to play. Other arts have ritual entry moments (lights dim, curtain rises). For games it's the invitation. In board games it's social; in digital games it's a start button. Some make it visceral: strapping on the Guitar Hero controller invites you to play the *fantasy*, not just the game.

Number of players. Some games need an exact count (solitaire: 1; tic-tac-toe: exactly 2). Others take a range (Parcheesi 2–4, Monopoly 2–8, World of Warcraft up to tens of thousands, yet one person alone still has a working game).

Roles. Most games give all players the same role (chess, Monopoly). Some require different ones: Mastermind's code-maker and code-breaker (the system won't work unless both are filled); football positions; RPG healers, fighters, and mages, which is why players make several characters in online worlds. Richard Bartle, creator of the first MUD, described four play styles that act like roles too:

achievers, explorers, socializers, killers. He found players have a primary style and rarely switch. Open worlds like Second Life let players define their own roles, which encourages creativity over competition. If your game has roles, their balance is critical.

EXERCISE 3.2 · THREE-PLAYER TIC-TAC-TOE

Make a version that works for three players. You'll probably have to change the board size and the win condition. Changing one formal element forces others to change.

The seven player interaction patterns (from E. M. Avedon)

PATTERN	STRUCTURE	EXAMPLES
1. Single player vs. game	One player against the system; needs puzzles or obstacles for conflict	Solitaire, Pac-Man, Tomb Raider
2. Multiple individuals vs. game	Several people play the system side by side, not against each other	Bingo, roulette, FarmVille
3. Player vs. player	Two players directly compete; personal, head-to-head	Chess, tennis, Mortal Kombat
4. Unilateral competition	Two or more players vs. one. "Highly undervalued"	Tag, dodgeball, Scotland Yard

5. Multilateral competition	Three or more directly compete; board games are tuned for 3–6	Poker, Monopoly, Call of Duty, StarCraft II
6. Cooperative play	Two or more players together against the system	Left 4 Dead 2, Journey, Portal 2
7. Team competition	Two or more groups compete; fans, clans, and guilds spring up around it	Soccer, charades, DotA, Team Fortress 2

Notes she adds: pattern 2 boomed with Facebook's asynchronous social games and suits noncompetitive players (casino games). Scotland Yard balances one criminal with full information against detectives who must cooperate to deduce his position, a great mix of co-op and competition. In Journey, two travelers can only communicate by singing a single note, and players formed "deeply meaningful relationships" anyway. Team Fortress 2's class system allows a huge range of play styles. Her nudge: most digital games use patterns 1 and 5; the others are underexplored. Want something fresh? Tune a digital game to the social feel of a 3–6 person board game.

EXERCISE 3.3 • INTERACTION PATTERNS

For each of the seven patterns, list your favorite games. If you can't think of any for a pattern, research some and play them.

Sidebar: Ian Bogost, "Persuasive Games"

Video games express ideas by **modeling systems**. You start with a "source system" (football, a city, airport security) and build a procedural model in code. This is **procedurality**: representation through rule-based behavior. Every model is subjective (a football game about coaching vs. one about being a lineman). The gap between the designer's model and the player's own model of the world is where games become expressive.

Examples: *Airport Insecurity* models TSA lines and lets you decide whether to sneak a knife through. *Cruel 2 B Kind* (with Jane McGonigal) is Assassin played

on city streets where you "kill with kindness." Persuasive games work by being "disruptive and strange," not seamless.

LESSON 3

Objectives: ten types

Objectives should feel challenging but achievable, and they set the **tone**: killing the enemy's forces feels different from spelling longer words. Games may give players different objectives, let them choose (Civilization: conquer everyone, *or* colonize Alpha Centauri), or let them invent their own (The Sims: keep the household alive, then set your own goals). Mini-objectives help reach the main one (each of Mario's 32 levels). A well-integrated objective strengthens the dramatic side too. Her sample objectives: Connect Four (four in a row), Battleship (sink all five ships), Mastermind (deduce the code in as few steps as possible), Chess (checkmate), Clue (deduce who, where, how), Katamari Damacy (roll up enough to make stars), Gone Home (discover what happened to the Greenbriars), Pokémon Go (catch as many as you can). Categories adapted from game scholars:

Capture

Take or destroy the opponent's stuff while avoiding capture. Chess, checkers, Quake, WarCraft.

Chase

Catch or elude. Tag, Fox & Geese, Assassin, Need for Speed, Scotland Yard.

Race

Reach a goal first, by dexterity or chance. Footrace, Parcheesi, backgammon, Virtua Racing.

Alignment

Arrange pieces in a configuration or make matching sets. Tic-tac-toe, Connect Four, Othello, Tetris, Bejeweled.

Rescue or escape

Get a unit to safety. Super Mario Bros., Prince of Persia, Ico.

Forbidden act

Make the opponent break a rule: laugh, let go, move wrong. Twister, Operation, Ker-Plunk, Johann Sebastian Joust. Rare in digital games.

Construction

Build, maintain, or manage. Animal Crossing, Minecraft, SimCity, The Sims, Settlers of Catan.

Exploration

Explore game areas, almost always combined with another objective. Colossal Cave, Zelda, Skyrim, Gone Home.

Solution

Solve a problem or puzzle first or best. Myst, Infocom text adventures, Tetris, tic-tac-toe.

Outwit

Use knowledge to beat other players: trivia (Jeopardy!) or in-game social knowledge (Diplomacy, Survivor).

Mixed objectives are where it gets interesting: real-time strategy games combine war with construction and attract players who'd want neither alone. Use the list to notice which objectives you like and don't, and how you might use them in your own ideas.

EXERCISE 3.4 • OBJECTIVES

List ten favorite games and name each objective. Do you see similarities? Try to define the types of games that appeal to you.

LESSON 4

Procedures: who does what, where, when, and how

Procedures are the methods of play. Ask: who can use it, what exactly they do, where it's available, when (turn, time, game state), and how they access it (physically, controller, voice). Most games have four kinds:

- **Starting action:** how play begins ("Choose a player to go first").

- **Progression of action:** the ongoing procedures, including the **core loop**, a set of activities that repeat to move the game forward. Board game example: roll the dice, move your piece, do what the square says.
- **Special actions:** available only in certain states ("when in water, press A to bob up"; "if you have a fire flower, B throws fireballs").
- **Resolving actions:** how play ends (four in a row in Connect Four). In Mario the system resolves it, not the players, so the manual never states it.

Her side-by-side: Connect Four vs. Super Mario Bros.

Connect Four: (1) choose who goes first; (2) on each turn, drop one checker into any slot; (3) alternate until someone gets four in a row horizontally, vertically, or diagonally.

Super Mario Bros. (from the 1986 manual): Select button picks the game type; Start starts or pauses; left/right arrows walk (hold B to run); Down crouches (Super Mario only); A jumps (higher the longer you hold) or bobs up in water; B accelerates, and with a fire flower throws fireballs.

Both state a starting action. Connect Four's progression is explicit (steps 2–3); Mario's is implied by walking commands in a real-time game. Connect Four has no special actions; Mario does (water, fire flower). Connect Four states its resolving action; Mario doesn't, because the system adjudicates it.

In board games, procedures live on the rule sheet and players run them. In digital games, they're in the controls section of the manual, and **system procedures** run behind the scenes (an RPG's damage calculation). That lets digital games process more, but it doesn't make them more complex: chess and Go get endless depth from simple objects and procedures.

Design for your environment: analog procedures must be easy to remember; digital ones depend on the input device and screen. Either way, the core loop must be quick to grasp so the game keeps moving.

EXERCISE 3.5 · PROCEDURES FOR BLACKJACK

List blackjack's starting action, progression, special actions (split, double down), and resolving action.

LESSON 5

Rules: three jobs

Rules define objects and allowable actions. Questions to ask: How do players learn the rules? How are they enforced? Are there patterns to rule sets? In digital games, rules can be **hidden**: the interface just doesn't offer the illegal move, or the program stops you. Her six sample rules:

- **Poker:** a straight is five consecutively ranked cards; a straight flush is five of the same suit.
- **Chess:** a player cannot move her king into check.
- **Go:** a player cannot make a move that recreates a previous board state.
- **WarCraft II:** to create knights, you must have upgraded to a keep and built a stable.
- **You Don't Know Jack:** if a player answers incorrectly, the others get a chance.
- **Jak and Daxter:** if you run out of green mana, you're knocked out and return to the last checkpoint.

From these, three kinds of rules emerge:

Rules defining objects and concepts

A "straight" exists only in poker. A chess king is an abstraction; the rules just borrow the idea of a king. Digital objects can carry many hidden variables (a WarCraft II knight: cost 800 gold, 90 HP, damage 2-12, armor 4) that players learn intuitively rather than calculate.

Rules restricting actions

"A player cannot move her king into check" prevents accidental loss. Go's rule against recreating a board state prevents endless loops. Field dimensions and team sizes overlap with boundaries and players. WarCraft II's "knights need a keep and a stable" keeps players on similar progression paths for balance.

Rules determining effects

If X happens, then Y. If you answer wrong in You Don't Know Jack, others get a shot.

If you run out of green mana in Jak and Dexter, you return to the checkpoint: a penalty that gets the game back on track without being cruel.

Board games define objects explicitly and keep them simple (a chess piece's only variables are color and position) because players must adjudicate themselves.

Digital games can track complex hidden states. Physical laws can compress rules too: gravity in Connect Four is an implicit rule about how pieces get placed.

Questions when defining objects: will players deal with complexity directly? Are simple objects differentiated enough? Do they evolve? How will players learn them?

Rules also close loopholes: Monopoly's "Do not pass Go, do not collect \$200" stops a jail sentence from becoming a reward. Effect rules create variation (they don't always trigger) and get play back on track (Jak's mild penalty makes you protect your mana). Balance matters: too many rules overwhelm players; unstated rules make them feel cheated. The less players understand the rules, the less they can make meaningful choices and the less in control they feel.

EXERCISE 3.6 · RULES RESTRICTING ACTIONS

What rules restrict player actions in Twister, Pictionary, Scrabble, Operation, and Pong?

EXERCISE 3.7 · RULES FOR BLACKJACK

Now write blackjack's rules. Try playing from what you wrote. What did you forget, and how did the missing rules change the game?

Resources: utility plus scarcity

Why does Diablo III have money, weapons, and potions but not paper clips or sushi? Because sushi doesn't help you reach Diablo's goals. In Katamari Damacy, paper clips and sushi *are* resources, because their size relative to your ball is what matters. Resources need both **utility and scarcity**. Too abundant and they lose value. Designers who copy existing games' resources get stuck; think abstractly instead:

TYPE	HOW IT WORKS	EXAMPLES
Lives	Classic arcade resource; more is always better	Space Invaders, Super Mario Bros.
Units	Multiple pieces per player; finite or renewable, same or different types	Checkers, chess, RTS games
Health	Dramatizes near-loss; needs a way to restore it (med kits are fast, resting is realistic but slow)	Diablo, action games
Currency	Greases trade so players don't have to barter	Poker chips, gold, Monopoly money
Actions	Moves or turns as a resource to ration	20 Questions, Magic's turn phases, "focus" time in Enter the Matrix
Power-ups	Temporary boosts, kept scarce	Mario's mushroom, Jak's blue eco
Inventory	Collected objects made scarce by price or the risk of finding them	RPG loot, a Magic deck, ammo
Special terrain	Places on the map that give value	WarCraft gold mines, Scrabble triple letter, baseball bases
Time	Inherently dramatic: countdowns, ticking bombs	Speed chess, hot potato, musical chairs

Details worth keeping: renewable units usually have a cost per unit, and only playtesting tells you if that cost is balanced. Health can be a separate resource or an attribute of a life; either way it dramatizes near-loss. Currency isn't the only way to build an economy (barter works too), and it need not be bank notes. Time "is an inherently dramatic force," and a countdown adds emotion to any design. Her challenge: invent original resource types, and borrow resource models from genres where they're rarely used.

EXERCISES 3.8 - 3.9

Utility and Scarcity: what are the resources in Scrabble and Call of Duty? How are they useful, and how does the system make them scarce? **Resource Types:** for each of the nine types, list favorite games that use it; research any you can't fill in.

LESSON 7

Conflict, boundaries, and outcome

Three sources of conflict

Conflict emerges because procedures offer *inefficient* means to the goal, forcing players to use skill, and creating a sense of competition or play that makes players submit to the inefficient system for the achievement of participating. Her examples of what causes conflict: keep the pinball in play using only flippers; get the golf ball from tee to hole past obstacles in as few strokes as possible; manage money and property in Monopoly's tight market; stay alive in Quake; maintain forces and resources in WarCraft III; outbid or bluff in poker. These point to three sources:

It comes from **obstacles** (the sack in a sack race, water on a golf course, puzzles in an adventure), **opponents** (other players, the main source in multiplayer games), and **dilemmas** (buy a property or upgrade one you own? Stay in or fold?). Dilemmas work in single- and multiplayer games alike.

Boundaries

Physical (a field, a board) or conceptual (a social agreement). Imagine football with no sidelines, Monopoly where you add real cash, or an infinitely expanding chess

board. Boundaries also make competition emotionally safe: you can crush your friend's civilization and shake hands after. Some games deliberately open their boundaries: ARGs like *I Love Bees* sent players to ringing payphones; "big games" like *Humans vs. Zombies* and *Ninja* take over public spaces; *Zombies, Run!* uses your real location.

Outcome

Outcome must be uncertain to hold attention, and it's usually resolved in a measurable, unequal result, though MMOs and simulations may have no winner or end state, rewarding players in other ways. Fullerton refuses to exclude these from "games"; exploring the border cases is more useful. In traditional games, players or the system check at intervals for a winning state. Outcome relates to the interaction pattern and the objective: in single player vs. game, you win, lose, or score points before losing (solitaire, pinball). A points objective uses points to decide; chess just checks whether the king is captured. Chess is **zero-sum**: a win (+1) and a loss (−1) always sum to zero. Many games are **non-zero-sum**: World of Warcraft, cooperative games like Knizia's Lord of the Rings, and narrative games like Gone Home. Non-zero-sum games can have subtler rewards: rankings, stats, multiple or player-created objectives.

Sidebar: Brenda Romero, "The Mechanic is the Message"

Can mechanics alone carry difficult emotions, the way paintings and music do? Romero's series of analog games says yes. It started when her 7-year-old daughter Maezza came home reciting facts about the Middle Passage with no feeling. Romero handed her wooden pawns and paint: "Make me some families." Then she grabbed pawns at random and put them on an index-card boat with pennies for food. "You forgot the mommy," Maezza said. "No one wants to go," Romero replied. Halfway across the ocean, the food ran short. "We can keep going and hope, or we can put some people in the water." Maezza stared and asked, "Did this really happen?" That day the family talked about the Middle Passage for hours.

She built a series of six games on difficult history: the Cromwellian invasion of Ireland (*Síochán Leat*, where you feel the powerlessness of being forced to turn on fellow Irish), the Trail of Tears (*One Falls for Each of Us*, with 50,000 pieces

so you feel overwhelmed by the system), Mexican immigration, daily life in Haiti, and *Train*. Her method: find the system that allowed the event to happen, then decide how the player should feel as a direct result of interacting with it.

Train is her best-known piece: players efficiently load yellow pawns into boxcars, until the destination card reveals the name of a Nazi extermination camp. The rules are deliberately ambiguous so players find "their own complicity or salvation." Her principle: "pure mechanic is pure player." No cutscene tells you how to feel; you followed the rules, and the meaning is yours.

Designer Perspective: Tim LeTourneau (The Sims, FarmVille 2)

Calls himself a game maker, not designer. Loves games with interlocking systems (SimCity). Process: brainstorm across disciplines, then mind-map how systems connect. On prototypes: "**they are sketches, not blueprints**" and they're disposable; never try to ship one. FarmVille 2 had a beloved water-on-the-board feature that confused players no matter how they explained it, so they cut it. "Great design is often the practice of great editing."

LESSON 8

Putting the elements to work

Use the formal elements to analyze the games you play in your game journal. Her closing exercises are good Flash-reflection material:

EXERCISES 3.10 – 3.13

Conflict: where does conflict come from in Tetris, Frogger, Bomberman, Minesweeper, and solitaire (obstacles, opponents, dilemmas, or a mix)?

Boundaries: what are the physical and conceptual boundaries of Dungeons & Dragons? **Outcome:** name two zero-sum and two non-zero-sum games and how the difference changes play. **Revise:** change backgammon so it doesn't depend on chance. How does the gameplay change?

Check yourself

answer key marked with ✓

Tag, dodgeball, and Scotland Yard are examples of which interaction pattern?

Multilateral competition

✓ **Unilateral competition (many vs. one)**

Cooperative play

Why: One player against the group. Fullerton calls this pattern "highly undervalued."

Twister and Operation share which objective type?

Alignment

Race

✓ **Forbidden act**

Why: The goal is to make the other player break a rule: fall, buzz, let go.

What is a "core loop"?

✓ **The set of procedures that repeat throughout play to move the game forward**

The story arc of a game

The rule that ends the game

Why: "Roll the dice, move your piece, do what the square says." Digital core loops also check game state and player input.

"A player cannot move her king into check" is an example of a rule that...

Defines an object

✓ **Restricts an action**

Determines an effect

Why: It limits what you can do (and prevents accidental loss). "If you run out of mana, you return to the checkpoint" would be an effect rule.

Why is sushi a resource in Katamari Damacy but not in Diablo III?

Katamari is a Japanese game

Diablo has a rule against food

✓ **In Katamari, sushi has utility (it grows your ball); in Diablo it wouldn't help you reach any goal**

Why: Resources must have both utility and scarcity within that specific system.

"Buy a new property or upgrade one you already own" is conflict from...

✓ **A dilemma**

An obstacle

A boundary

Why: The three sources are obstacles, opponents, and dilemmas. A dilemma is a choice with a range of consequences.

Which is a non-zero-sum game?

Chess

✓ **A cooperative board game where everyone wins or loses together**

A tennis match

Why: In zero-sum games one player's win is exactly another's loss. Cooperative, MMO, and narrative games break that.

What does Brenda Romero mean by "the mechanic is the message"?

Games should have long text explanations

Cutscenes carry the meaning of a game

✓ **Meaning can arise from the rules and what the player does with them, with no story needed**

Why: "Pure mechanic is pure player." In Train, the player followed the rules, and the resulting meaning is theirs alone.

Formal elements make it a game. Dramatic elements make you care.

About 20 minutes 7 lessons • 8 check questions

BIG IDEA

Challenge and play are in every game. Premise, character, story, and a dramatic arc overlay the formal system to give it context and emotion. The best games align rising gameplay tension with rising dramatic tension.

LESSON 1

Challenge and flow

EXERCISE 4.1 • MAKING CHECKERS DRAMATIC

Checkers has no story, no characters, no reason to capture pieces except that it's the objective. Add dramatic elements (backstory, named pieces, special board areas), play it with friends, and note whether it helps or hurts.

When players say they want "challenge," they don't mean "hard." They mean tasks that are **satisfying to complete**, with just the right amount of work. Challenge is **individualized** (Chutes and Ladders is hard for a kid learning to count, boring for an adult) and **dynamic** (once you master a task, it's no longer challenging, so the game must adapt).

Psychologist Mihaly Csikszentmihalyi studied enjoyment across musicians, rock climbers, painters, and gamers and found they all described it the same way. He called the state **flow**.

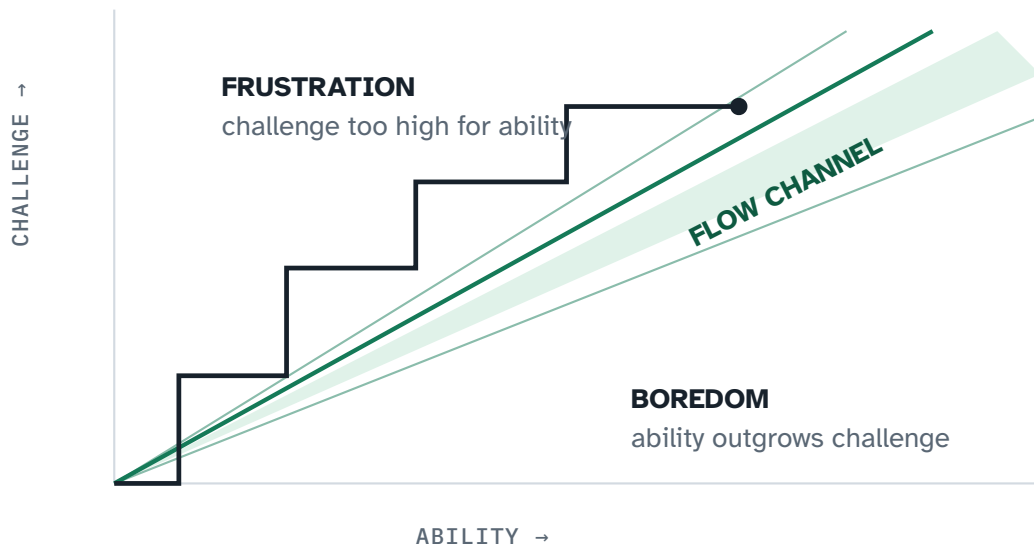


Figure 4.1. As ability rises, challenge must rise with it. The stepped line is a player's path: learn (ability goes right), then face a harder task (challenge goes up), staying inside the channel.

The eight elements of flow

1. **A challenging activity that requires skill.** Goal-directed, bounded by rules, needs skill (physical, mental, social). No skill means meaningless, not challenging.
2. **Merging of action and awareness.** The activity becomes spontaneous, almost automatic; you stop feeling separate from what you're doing.
3. **Clear goals and feedback.** Musicians know the next note and hear mistakes. Players know what wins and get direct feedback.
4. **Concentration on the task at hand.** Laundry and TV disappear. Full-screen interfaces exist for this reason.
5. **The paradox of control.** You can only feel in control when the outcome is uncertain. "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." This is why meaningful choices without guaranteed results are central to game design.
6. **Loss of self-consciousness.** No room for ego protection, yet you emerge with a stronger sense of self afterward.
7. **Transformation of time.** Hours pass like minutes (or a split second stretches out). Games are notorious for this.

8. **Experience becomes an end in itself.** The activity becomes **autotelic** (done for its own sake) rather than exotelic (done for some other goal).

She stresses these aren't a step-by-step recipe; you must work out what they mean for your game. Design questions she draws from this: What skills does your audience have, and how do you balance for them? How do you give clear goals, meaningful choices, and discernible feedback? How do you merge what a player does physically with what they must think about? How do you remove distractions and fear of failure? How do you make the activity enjoyable in itself?

EXERCISES 4.2 – 4.4

Dramatic Games: name five games you find dramatically interesting and what makes them compelling. **Skills:** list the skills your favorite games require, and other skills people enjoy that you could build a game around. **Goals and Feedback:** pick three games, list the feedback each gives, and relate it to the ultimate goal.

LESSON 2

Play: types, players, and levels of engagement

Play is "free movement within a more rigid structure." In games, rules are the structure and play is the freedom inside them: emergent experience and personal expression. The documentary *The Promise of Play* collects definitions ("boisterous," "not scripted," "child's work"); the takeaway is that play is **a state of mind**, not one activity. Play teaches skills, socializes, helps solve problems, relaxes, and makes us see things differently. It can also be serious: as experimentation and boundary-pushing, it's common ground for artists, scientists, and children (one of the few areas where kids are the experts). A playful approach can be applied to even the most serious subjects.

Brian Sutton-Smith (*The Ambiguity of Play*) lists play activities: mind play like daydreaming, solitary play like collecting or crafts, social play like joking or dancing, performance play like music or acting, contest play like board and video games, and risky play like hang gliding.

Roger Caillois's four types of play (Man, Play and Games, 1958)

Agôn

Competitive play. Chess, sports, WarCraft III.

Alea

Chance-based play. Dice, roulette, lotteries.

Mimicry

Make-believe play. Role-playing, theater, dress-up.

Ilinx

Vertigo play. Spinning, roller coasters, extreme sports.

He crosses these with **ludus** (rule-based play) and **paidia** (free-form, improvisational play). Strategy games are competitive ludus; RPGs mix mimicry and competition in a rule-based frame. Naming the pleasure a game offers helps you write player experience goals.

Ten types of players

Beyond Bartle's four, Fullerton lists the pleasures players come for: the **Competitor** (beat others), **Explorer** (curious, seeks the edges), **Collector** (sets, trophies, knowledge), **Achiever** (ladders and levels), **Joker** (plays for fun, can annoy serious players or make things social), **Artist** (creation and design), **Director** (in charge), **Storyteller** (lives in imagined worlds), **Performer** (puts on a show), and **Craftsman** (builds, engineers, puzzles). Many of these are underserved by today's digital games.

Three levels of engagement

Spectator play (watching a friend's turn, watching sports) is real and rarely designed for. **Participant** play is active and the most directly rewarding.

Transformational play actually changes the player's life, the way children learn through play. Serious games like *Peacemaker* (bring peace to the Middle East) aim for this level.

EXERCISE 4.5 · PLAYER TYPES

For each of the ten player types, name a game that appeals to it. Which type are you?

Premise: turning data into a world

Imagine a game where you are "a set of data" trying to increase your values by engaging other data sets via complex algorithms. Boring, yet that's exactly what a combat system is, formally. Now you're a dwarf named Gregor attacking an evil wizard with a broadsword. Same system, and suddenly you care. That overlay is the **premise**: it establishes the action within a setting or metaphor.

In drama, premise comes from the **exposition**: time and place, characters, the status quo, plus the **problem** (what upsets the status quo) and the **point of attack** (where the plot begins). Those last two mirror a game's objective and starting action.

PREMISE	SETTING	PROTAGONIST	STORY BEGINS WHEN
Star Wars IV	A faraway galaxy	Luke, a farm boy who wants to join the rebellion but is held back by loyalty	His uncle buys two droids carrying secrets
Fellowship of the Ring	Middle-earth	Frodo, a Hobbit happy at home	He inherits a ring that threatens all of Middle-earth
Die Hard	An L.A. office tower	John McClane, off-duty cop trying to reconcile with his wife	Terrorists seize the building and take his wife hostage
Space Invaders	Earth, under alien attack	An anonymous defender	The first shot is fired
Pitfall	A forbidden jungle	Pitfall Harry, explorer and fortune hunter	You enter the jungle
Diablo	Tristram, ravaged by Diablo	A wandering warrior	You accept the townspeople's quest

Myst

A deserted
island of
arcane
machines

An anonymous visitor

Two trapped brothers
each beg for help and
warn you about the
other

Space Invaders' premise is thin but powerful: nobody needed a backstory to feel the aliens approaching. *Myst*'s is richer: the brothers might be lying, so you must decide whom to trust. A premise's first job is to **make the formal system playable** (shoot aliens, not blocks; find diamond rings in Pitfall, not "a resource worth 5000 points"). Its second is **emotional appeal**. A premise that unifies formal and dramatic elements is another way to heighten the experience, and as premises grew more elaborate they evolved into full stories.

EXERCISE 4.6 • PREMISE

Write out the premise for five games you've played and describe how each premise enhances the game.

LESSON 4

Character: agency vs. empathy

Characters are the agents through whom drama is told. They can be psychological (mirrors of our fears and desires), symbolic (standing for big ideas), representative (of a group), or historic. The **protagonist** drives the conflict; the **antagonist** opposes. Characters are revealed by what they say, do, look like, and what others say about them. **Round** characters have real traits and change (Rick in *Casablanca*, Hamlet); **flat** ones are stereotypes and foils (the lazy guard, the evil stepmother).

Four questions for any character: What does the character **want**? What does the character **need**? What does the player **hope**? What does the player **fear**?

Game characters add a unique tension: **agency** (the character as the player's representation in the game) vs. **empathy** (the player's emotional attachment to the character). Mario in *Donkey Kong* was flat and static, defined by a nose and overalls, and did nothing without the player. Kratos (*God of War*) has a revenge backstory that deepens as you play. Wander (*Shadow of the Colossus*) is rounded by his

actions and by slowly transforming into his own enemy. Player-created avatars (World of Warcraft) can create as much empathy as authored heroes. Neither approach is better; pick the one that fits your experience goals.

Free will vs. player control

Player-controlled characters can't always act on their own, which limits how much personality they can show. AI-controlled characters have autonomy, which creates tension between what the player wants and what the character wants. Sonic tapped his foot impatiently if you stopped playing: his own personality, not yours. The Sims' "free will" setting lets characters choose actions unless you intervene, producing a "complicated dance" between what you want and what they "wish." Halo's enemies track fear and flee when outnumbered. *Façade* generates a whole dinner-party story from character AI and your input. Believable AI is "a holy grail" for both player characters and NPCs; characters are evolving into rounded, dynamic individuals with growing importance in games' dramatic structures.

EXERCISE 4.7 · GAME CHARACTERS

Name three compelling game characters. How are they brought to life? What lets you identify with them? Round or flat, dynamic or static?

LESSON 5

Story: the uncertainty problem

Stories and games both begin uncertain. The difference: a film's uncertainty is resolved by the **author**; a game's by the **players**. That's why integrating traditional storytelling into games is so hard. Her taxonomy:

Backstory

An elaborate premise. Story chapters between levels (WarCraft, StarCraft) that gameplay never changes. Fail and you replay the level like Groundhog Day until you earn the next story beat.

Branching story

Choices feed predetermined branches. Heavy Rain (shave, fight, cut off your finger to save a child) has wildly different endings. Usual problem: limited scope, simplistic feel, dull paths.

Emergent story

Story arises from gameplay. The Sims gives tools (snapshots, scrapbooks) so players build stories the designers never wrote.

Compare two zombie-apocalypse adventures: *The Last of Us* has a linear story about Joel and Ellie that the player can't change, yet it's richly integrated with play. *The Walking Dead* lets dialogue and actions shift relationships and even who dies, carried across episodes. Neither structure wins; both are experiments in deepening story without sacrificing gameplay.

EXERCISE 4.8 • STORY

Pick a game that successfully melds story with gameplay. Why does it succeed? How does the plot unfold as the game progresses?

Sidebar: Ian Dallas, "Directing Games for Emotion" (What Remains of Edith Finch)

Most games target fun emotions (joy, desire, triumph). Edith Finch targeted **the sublime**: beautiful and overwhelming at once, inspired by a teenage scuba dive where the seafloor sloped into darkness. The first prototype was literally a scuba simulator. It looked right and felt flat: players fretted about controls and objectives. So the team went hunting for the feeling elsewhere: forests, storms, a fragile person against a vast landscape, childhood memories with family. They found "Weird Fiction" short stories evoked the sublime, so the game became a collection of short stories.

His two director's questions: **Where are we going?** and **What's most broken?** Use image searches and film soundtracks to pin down a mood. Communicate to the team with an interactive prototype when you can. Frustrating controls knock players out of a delicate mood, so run short, frequent playtests and fix a

few issues at a time. "Work with the grain": do more of what players are unexpectedly enchanted by.

LESSON 6

World building and the dramatic arc

World building is the natural fit between story and games: maps, histories, cultures, languages, economies. Tolkien built languages first, then the elves who spoke them, then the stories. World of Warcraft, Star Wars, and Star Trek span games, films, and fan creations. Henry Jenkins: storytelling has become "the art of world building." *Minority Report* held an "idea summit" of scientists and urban planners to define the world's rules; its gestural interface later inspired Kinect. Alex McDowell calls this cross-platform process "immersive design."

The classic dramatic arc

The most important dramatic element is one you already know from the formal side: **conflict**. Traditional conflict types (character vs. character, nature, machine, self, society, fate) map onto game types (player vs. player, vs. system, vs. multiple players, team vs. team). Once set in motion, conflict must **escalate**.



Figure 4.20. Exposition sets up the world. Conflict appears when the protagonist's goal is opposed. Rising action escalates to a climax whose outcome decides everything, then falling action and resolution.

Jaws: Sheriff Brody (protagonist, afraid of water) wants to keep Amity safe; the shark (antagonist) attacks. Keeping people out of the water fails, the shark

threatens Brody's own kids, and he must face his fear and go hunt it. Climax: the shark attacks Brody. Resolution: he kills it.

Donkey Kong: Mario must save Pauline before time runs out, climbing girders past barrels and fireballs. Each time he reaches her, Kong carries her higher, and each level is harder, so tension rises. Climax: remove all the rivets so Kong falls.

Fullerton's critique: Mario has no internal conflict, and Pauline's jeopardy never increases, a missed chance to integrate the two systems.

But here's what games have that films don't: **you** resolve the climax. Our response to Brody killing the shark is empathy; our response to toppling Kong is empathy plus **personal accomplishment**. That's the power of integrating formal and dramatic conflict.

Journey: Jenova Chen designed the game's emotional arc on Joseph Campbell's Hero's Journey (call to action, threshold, trials, the abyss with death and rebirth, transformed return), expressed through color, architecture, sound, and subtle shifts in mechanics. Playtesting showed the leap from the abyss to revelation wasn't big enough, so the team redesigned it to be **twice as extreme**.

EXERCISES 4.9 – 4.11 • PLOTTING A STORY

Pick a story game you've finished (Mass Effect 3, Deus Ex, BioShock Infinite, KOTOR). (1) Plot the story on the dramatic arc: exposition, protagonist, conflict, what raises tension, the climax, the resolution. (2) Plot the gameplay on the same arc: are controls explained in the exposition, does gameplay raise tension, what gameplay event is the climax? (3) Propose three changes to integrate story and gameplay better.

LESSON 7

Conclusion and the two perspectives

The dramatic tools are only as powerful as the inspiration behind them. Games' emotional impact "still has not achieved the depths it is capable of." Her challenge: what new dramatic ground will your designs break? To answer it you need both traditional dramatic craft and solid gameplay process.

Designer Perspectives: Dr. Ray Muzyka (BioWare) and Don Daglow

Ray Muzyka trained as an ER doctor while co-founding BioWare (Baldur's Gate, KOTOR, Mass Effect, Dragon Age). All his favorite games share one trait: emotionally engaging and very high quality. Advice: be passionate but self-critical and humble about feedback; know when you've hit diminishing returns; hire smart people and treat them extremely well.

Don Daglow wrote the first interactive sports game (1971) and first computer RPG (1975). Games that changed design: Seven Cities of Gold, Super Mario Bros., SimCity (broke every "commandment": no opponents, no clear goal), Madden on Genesis, GTA III (running AND driving, radio stations), Minecraft. Advice: "Enjoy the journey, not just the wrap party." Chasing celebrity by 30 is the fastest way to sabotage a career.

Check yourself

answer key marked with ✓

According to flow theory, what happens when challenge stays flat while a player's ability rises?

Frustration

✓ Boredom

Flow

Why: Too much challenge causes frustration; too little causes boredom. Flow is the channel between them, which requires challenge to rise with skill.

The "paradox of control" means...

Players want complete control over the outcome

Controllers are hard to design

✓ You can only feel in control when the outcome is uncertain and you can influence it

Why: Guaranteed success isn't enjoyable. Meaningful choices without assured outcomes are the sweet spot.

An activity done for its own sake is called...

✓ Autotelic

Exotelic

Ludic

Why: Greek for "an end in itself." Most of life is exotelic (done for another goal); art, music, sports, and games are autotelic.

Match Caillois's terms: roller coasters and spinning until dizzy are...

Agôn

✓ Ilinx

Mimicry

Why: Ilinx is vertigo play. Agôn is competition, alea is chance, mimicry is make-believe. Ludus (rules) vs. paidia (free-form) cuts across all four.

A premise's first job is to...

Tell a complete story with a beginning, middle, and end

Replace the rules

✓ **Make the formal system playable by giving abstract mechanics a concrete context**

Why: Shoot aliens instead of blocks; find diamond rings instead of "a resource worth 5000 points." Emotional appeal is the second job.

"Agency" in a game character refers to...

✓ **The character's function as the player's representation in the game**

The player's emotional attachment to the character

The character's talent agent

Why: Agency is the practical function; empathy is the emotional attachment. Designers balance the two.

Why is traditional storytelling hard to integrate into games?

Games have no characters

✓ **A story's uncertainty is resolved by the author, but a game's is resolved by the players**

Players don't like stories

Why: That's why designers try backstory, branching, and emergent approaches, each with tradeoffs.

What did playtesting reveal about Journey's dramatic arc?

Players wanted more combat

The exposition was too long

✓ **The emotional leap from the abyss to revelation wasn't big enough, so the team made it twice as extreme**

Why: A designed arc still needs playtesting. Chen mapped emotional intensity per level against the Hero's Journey and adjusted from player data.

A game is a system. Set it in motion and things emerge you couldn't predict.

About 25 minutes 8 lessons • 8 check questions

BIG IDEA

Every game system is built from objects, their properties, their behaviors, and the relationships between them. Change any one and the whole system shifts. Designers control the experience through information, control, and feedback, then tune by playing.

LESSON 1

The four building blocks of any system

A **system** is a set of interacting elements forming an integrated whole with a common purpose (general system theory, Ludwig von Bertalanffy, 1940s). A stapler is a system. So is a government. Unlike most systems, a game's purpose isn't to make a product or do a task. It's to entertain. Systems can be predictable (one or two outcomes) or wildly unpredictable; which you want is your call. To control that, you need the four basic elements:

Objects

The building blocks: chess pieces, the bank in Monopoly, the players themselves, avatars, and even terrain (squares on a board, yard lines). Define terrain with the same care as pieces.

Properties

Values that describe an object. A checker has three: color, location, type (normal or king). A Diablo character has dozens (health, strength, dexterity, experience, level) that change during play. More properties means less predictable relationships.

Behaviors

Potential actions an object can take in a given state. A checker: move diagonally forward one space, or jump to capture (and you must jump if you can). A Diablo character: run, attack, cast, pick up, talk, trade, learn skills. More behaviors add choice and reduce predictability.

Relationships

How objects relate. No relationships means you have a *collection*, not a system: blank index cards are a collection; number them and they become a system.

Relationships can be fixed (a numbered sequence, Monopoly's board), change with play (checkers moving), depend on proximity and need (The Sims' fridge is more interesting to a hungry Sim), or be introduced by chance.

Chance and rules together: the WarCraft II combat formula

Each unit has Hit Points, Armor, Basic Damage, and Piercing Damage. Damage per attack is $(\text{Basic Damage} - \text{Target's Armor}) + \text{Piercing Damage}$, then a random 50–100% of that. An ogre (8 basic, 4 piercing) vs. a footman (armor 2) can do 5 to 10 damage, killing the 60 HP footman in about 8 swings. The footman (6 basic, 3 piercing) vs. the ogre (armor 4) does only 3 to 5, needing 18 perfect swings against 90 HP. The rule set fixes the range; chance decides within it.

EXERCISES 5.1 – 5.3

Pick a board game you own with clearly identifiable objects (strategy games work best). List every object and its properties. Then add each object's behaviors in different game states. Then describe the relationships: defined by position? power? value?

LESSON 2

System dynamics: why you can't change just one thing

If you can remove a component without affecting the system, it was a collection. A system needs all its parts, arranged in a specific way. Her thought experiment: replace WarCraft II's damage formula with a random roll from 1 to 20. Now chance dominates every battle, upgrades and armor become worthless, and the only

strategy is to build the most units. Go the other way and remove the random 50–100% roll: every fight becomes perfectly predictable, which kills engagement. Either change transforms the whole system.

Systems are greater than the sum of their parts, so games can only be understood in play. Salen and Zimmerman call design a **"second-order" problem**: you can't directly determine the player experience; you craft a "possibility space" and playtest it as hard as you can.

Sidebar: Deconstructing Set

Marsha Falco invented Set in 1988 while studying epilepsy in German shepherds; her kids started playing with her data cards. The deck has 81 unique cards with four properties (shape, number, pattern, color), each with three options: $3 \times 3 \times 3 \times 3 = 81$. A "set" is three cards where each property is either all the same or all different. Twelve cards are dealt; call "Set!" and take them. For any two cards there is exactly one third card that completes a set.

Why four properties with three options? Add a fifth property (background color) and the deck becomes 243 cards; add a border, 729; add animation in a digital version, 2,187, with about 30 times less chance the card you need is on the table. Probably unplayable. Adding a fourth *option* to each property gives 256 cards, only about three times harder. New players often remove color to play with 27 cards, then add it back. Lesson: build a matrix of your properties, calculate complexity, and playtest, because a more complex system is not automatically a more satisfying one.

LESSON 3

Possibility space: tic-tac-toe, chess, Mastermind, Clue

Tic-tac-toe: nine spaces (objects) with three property values (null, X, O) and fixed relationships by location. The first player has only three meaningful moves (center, corner, side); playing center leaves the opponent two meaningful replies. The game tree is tiny, so once you learn the optimal moves you always win or tie, and players lose interest.

Chess: six unit types plus 64 spaces. Individually the objects aren't more complex than tic-tac-toe squares, but their varied movement behaviors *change the relationships with every move*. The tree explodes past the first few moves, so both humans and chess programs rely on pattern recognition and memory of past games instead. That's why chess stays interesting after mastering the rules.

More possibility is not always better. Trivial Pursuit and side-scrollers have small outcome spaces and work fine; branching adventure games have limited endings. Open-world games, RTS games, and MMOs enlarge the space by adding objects with defined relationships, buying scope, creative solutions, and replayability for a certain kind of player.

Mastermind vs. Clue

	MASTERMIND	CLUE
Players	2: code-maker and code-breaker	3–6, all the same role
Puzzle size	4 pegs × 6 colors, repeats allowed = $6^4 = 1,296$ codes. A fifth peg: 7,776. A seventh color: 2,401.	6 suspects × 6 weapons × 9 rooms = 324 combinations
How you learn	Pure logic and deduction from feedback pegs	Logic plus dice, movement, social cues, reading faces
Chance	None	Dice and board movement even the field for weaker deducers (kids)
Drama	None	Murder premise and colorful characters: a "family game"

Same objective (solve a combinatorial puzzle), completely different experiences. The designers of Mastermind surely playtested the peg and color counts before settling on four and six.

EXERCISE 5.4 • SYSTEM DYNAMICS

Take your game from 5.1–5.3 and make significant changes to properties, behaviors, or relationships (in Monopoly, change every price and rent, or the movement rules). Play. Still balanced? Playable? Change something else (remove all positive Chance cards). Keep going until the game breaks. What was the crucial change, and why did it break the game?

LESSON 4

Economies

When a game allows exchange of resources with the system (Monopoly's bank) or between players, that trade forms an economy. You need **items of exchange** (resources), **agents of exchange** (players, the bank), and **methods of exchange** (markets, trades). Currency is optional. Before building one, ask: Does the economy grow over the game? How is the currency supply controlled? Are prices set by the market or the system? Are trades restricted by turn, time, cost, or partner?

GAME	TYPE	PRODUCT	MONEY	PRICES
Pit	Simple barter. Eight commodity suits of nine cards, worth 50–100 points; corner a market by collecting all nine	Fixed	None	Fixed (printed)

Settlers of Catan	Complex barter. Settlements produce brick, wood, wool, ore, wheat; trade only on your turn, resources only, unequal amounts allowed	Controlled growth (dice production; roll a 7 and anyone over 7 cards loses half)	None	Market value, capped by the bank's 4:1 trade
Monopoly	Simple market. 28 properties, \$1,500 to start; unsold property goes to auction; players trade at any agreed price	Fixed	Controlled growth (\$200 per lap; the bank never goes broke)	Market value (face value, then auction and trades)
Ultima Online / EverQuest	Complex market, persistent. Start with a little gold and gear; enter the "labor market" killing small animals; sell to shopkeepers or players	Controlled growth (Ultima tried self-regulating recycling but players hoarded, so designers took direct control)	Controlled growth	Market value with a base (shopkeepers buy anything, keeping newbies employed; scarce items trade player-to-player)

Magic: The Gathering

Metaeconomy.
The game has
no trading
inside it; the
cards are the
resource of a
worldwide
market
around it

Controlled
growth
(publisher
sets rarity)

None

Market value
(publisher
has no
control after
sale)

Supply and demand shows up in Catan: a glut of wheat crashes its value; scarce ore gets traded for aggressively. In Ultima and EverQuest a **metaeconomy** emerged where characters sold on eBay for hundreds of dollars. Magic's deck-building is itself a balancing exercise the player performs. **Free-to-play** games like Clash of Clans (start with 500 gems, spend 250 in the tutorial, buy more with real money) make the metaeconomy part of the design. Her rule: every action players take in the economy should advance or hinder their progress toward the objective, and nothing builds community like an economy that makes socializing into a game.

EXERCISE 5.5 • BARTERING SYSTEMS

Add a layer of complexity to Pit's trading, for example commodity values that change dynamically during play.

LESSON 5

Emergent systems

Simple rules can produce complex, unpredictable results. This is **emergence**. One ant is simple; a colony engineers, defends, and stores food. Some researchers think consciousness itself is emergent.

John Conway's **Game of Life** (Cambridge, 1960s) shows it on a checkerboard. He designed, tested, and revised rule sets for years like a game designer, and landed on three:

- **Birth:** an empty cell with exactly three populated neighbors becomes populated.
- **Death by loneliness:** a populated cell with fewer than two neighbors dies.

- **Death by overpopulation:** a populated cell with four or more neighbors dies.

Different starting patterns evolve wildly differently. The "R Pentomino" ran for a hundred generations until a cluster of cells detached and walked across the board. Richard Guy yelled, "Look, my bit's walking!" They'd discovered the **glider**. Games using emergent techniques: The Sims, GTA 3, Halo, Black & White, Pikmin, Metal Gear Solid 2. Halo's characters run on three impulses (perception of the world, memory of the world's state, and emotion like growing fear); if their friends die and they're outgunned, they run. Will Wright gave The Sims' household items values, so a sleepy Sim's rules interact with a bed's rules.

LESSON 6

Interacting with systems: information, control, feedback

Information structure

Less information means less informed choices, less sense of control, more room for chance, misinformation, and deception.

Open

Complete information about the game state. Chess, Go. Encourages calculation-based strategy.

Hidden

Players don't see certain data. Five-card stud with all cards face down: you only know how many cards and how they bet. Encourages bluffing and social reading; appeals to a different player.

Mixed

Some data known, some not. Seven-card stud (some cards up, some down), blackjack.

Dynamic

Information changes during play. WarCraft's "fog of war": you see enemy territory only while a unit is there, then the view freezes. Mostly possible only in digital games.

Control

Board games use direct manipulation; digital games use keyboards, mice, joysticks, gestures, touch, or speech (Amazon Echo games). No control type is inherently better; it must suit the experience. **Direct** control moves your character; **indirect** control (Rollercoaster Tycoon) changes ride prices and designs to influence guests you can't command. Real-time vs. turn-based is another axis. Her thought experiment: what if StarCraft II automatically assigned 50% of workers to minerals and 50% to gas? Would it remove tedium, or kill critical resource management?

Feedback loops

In systems terms, feedback means the output of an interaction directly changes another element. **Reinforcing (positive)** loops push a change further in the same direction: score a point, get a free turn. In Jeopardy! a correct answer keeps control of the board, reinforcing the leader. **Balancing (negative)** loops push the other way toward equilibrium: in football, when you score, the other team gets the ball. Catan's rule that a 7 makes anyone holding more than seven cards discard half keeps the rich from running away with it. Reinforcing loops create satisfying risk/reward and drive toward an unequal outcome; balancing loops keep the game from resolving too fast. A good designer evaluates how quickly the game is progressing and knows when to add a balancing factor.

EXERCISES 5.6 – 5.8

Hidden Information: take an open-information game (chess, checkers, Go, mancala) and add hidden information. How does strategy change?

Information Structures: classify Unreal Tournament, Age of Empires, Jak II, Madden, Lemmings, Scrabble, Mastermind, and Clue as open, hidden, mixed, or dynamic. **Control:** for the same games, direct or indirect? Real-time or turn-based? Any mixed cases?

LESSON 7

Tuning game systems

The only way to understand a system is to run it. After defining the elements, playtest and tune: first by yourself and with other designers, then with outside

players. Three things to test for, in order:

1. **Internally complete.** Rules cover every loophole. If players argue over how the rules handle a situation, the system isn't complete; you get dead ends or ways around the intended conflict.
2. **Fair and balanced.** Every player has an equal opportunity. Built-in advantages make others feel cheated. Dominant strategies and overpowered objects reduce meaningful choice.
3. **Fun and challenging.** Elusive and individual. Test with the *intended audience*, not the designer or the designer's friends; an adult can't accurately judge difficulty for children.

Sidebar: Daniel Cook, "Interaction Loops and Arcs"

All games are built from **interaction loops**: (1) the player's mental model prompts (2) a decision to (3) take an action that (4) manipulates the rules, which return (5) feedback that (6) updates the mental model. Repeat. A new Mario player presses a random button, sees Mario jump, and after a few loops learns "A makes Mario jump." Mastery only arrives through repeated passes. Loops nest into **skill chains**: you must master jump and move before you can kill a Goomba, so if a player is stuck, ask whether they mastered the precursor skills. Loops run at different frequencies, from jumping every second to progression loops in an MMO that take months.

Arcs deliver authored content (a story, a cutscene, the princess at the end of Mario). Same six steps, but the payload is 99% feedback and the value drops sharply after one exposure. Studios that rely on arcs live on a "content treadmill." His analysis question: *what repeats and what does not?* His exercise: strip a genre of all content payloads and architecture (narrative, art, music, levels, menus) and see what functional loops remain; then rebuild something new from those ingredients instead of recreating the same meal.

Two designer perspectives

Alan R. Moon (Ticket to Ride, Elfenland)

Started at Avalon Hill, then Parker Brothers. Favorites: Descent, Carcassonne: Hunters & Gatherers, Adel Verpflichtet, Love Letter (16 cards and "the elegance of simplicity"), and a plain deck of cards. Biggest influence: Sid Sackson's Acquire. Advice: play as many games as you can ("it's research"); it took him 14 years to have real success; develop a core group of playtesters; learn when to let a design go; be organized and a good salesman; build a network; learn to deal with rejection.

Frank Lantz (NYU Game Center, Drop7, Pac-Manhattan)

Favorites: Go ("simplicity and depth"), poker as a martial art, Shadow of the Colossus. Magic: The Gathering showed him you can invent a whole new genre and social context. His process in one line: "Start with a fun game, put some stuff in it, then take some stuff out." For a Sopranos TV game that had to be deterministic (no gambling), produce one winner among thousands, be fun for nongamers, and unsolvable for experts, he built an **NP-complete** scoring system (points for groups of touching pieces, like Tetris or Minesweeper). Advice: play deeply, "simplificate," think like a programmer and an artist, advocate for the player but don't treat them like a child, fail often, persist.

Check yourself

answer key marked with ✓

What are the four basic elements of a system?

Players, rules, story, art

Goals, feedback, chance, skill

✓ **Objects, properties, behaviors, relationships**

Why: Objects are defined by their properties and behaviors, and by their relationships with other objects.

A stack of blank index cards is a collection. What turns it into a system?

✓ **Adding relationships, like numbering them or marking suits**

Buying more cards

Putting them in a box

Why: No relationships, no system. Remove the "3" from a numbered sequence and the dynamics change.

If WarCraft II's damage were replaced with a random 1–20 roll, what would happen?

Battles would become perfectly predictable

✓ **Upgrades would become worthless and the only strategy would be sheer numbers**

Nothing would change

Why: Chance would dominate, so armor and unit upgrades stop mattering. Removing all chance instead makes fights predictable and boring.

Why does chess stay interesting after you master its rules, unlike tic-tac-toe?

It has more players

It uses dice

✓ Varied piece behaviors change relationships every move, making the possibility space enormous

Why: Tic-tac-toe's fixed relationships and tiny tree let you learn the optimal moves. Chess is too vast to tree out, so players use pattern recognition.

In Catan, when a 7 is rolled anyone holding more than seven cards discards half. This is a...

✓ Balancing (negative) feedback loop

Reinforcing (positive) feedback loop

Hidden information structure

Why: It counteracts the prosperous player's advantage, pushing toward equilibrium and keeping the game from resolving too quickly.

"Fog of war" in an RTS is an example of which information structure?

Open

✓ Dynamic

Hidden

Why: Information changes as units move in and out of territory, shifting the balance between knowledge and cunning.

Conway's Game of Life demonstrates...

That games need story to be interesting

That random systems are the most fun

✓ **Emergence: three simple rules produce complex, unpredictable patterns like the glider**

Why: Birth at exactly three neighbors, death below two or at four or more. From that, "life-form-like patterns" emerge.

What are the three things to test for when tuning, in order?

✓ **Internally complete, fair and balanced, fun and challenging**

Graphics, sound, story

Price, platform, marketing

Why: Loopholes first, then fairness, then fun tested with the intended audience.

Ideas don't come from thin air. Here's how to manufacture them.

About 20 minutes · 7 lessons · 7 check questions

BIG IDEA

Feed your mind, brainstorm with discipline (state a challenge, no criticism, go for 100 ideas), then edit on a different day, narrow to three, define the game's "X," and pin down the formal elements before story distracts you.

LESSON 1

Where do ideas come from?

"Great ideas come from great input into your mind and senses." Spend part of every day doing something other than playing games: read, watch films, take photos, exercise, draw, volunteer, learn a language. Reiner Knizia: "starting from the same beginning will frequently lead to the same end."

Csikszentmihalyi (the flow psychologist) also studied creativity and describes five stages:

1. **Preparation:** immersion in a topic or set of problems.
2. **Incubation:** ideas churn below consciousness.
3. **Insight:** the "aha!" moment.
4. **Evaluation:** deciding whether the insight is valuable and original.
5. **Elaboration:** the longest, hardest part. Edison's "99% perspiration."

The process is "less linear than recursive." Work on preparation and incubation all the time, and always carry a notebook or phone because you can't predict when insight strikes. And remember: a game idea usually includes some aspect of the *system*. "I want to make a game about studying Chinese" isn't yet a game idea; an insight about using symbolic characters to hide ideas in a system is, even if the final game has nothing to do with Chinese.

Ideas also come from analyzing games in your game journal (dig into formal, dramatic, and dynamic elements and your emotional cycles, not "coolness"), from USC's **game deconstruction salons** where students present formal analyses to industry pros, and from innovative board games whose mechanics are on the surface, not hidden in code: Settlers of Catan, Carcassonne, Scotland Yard, El Grande, Modern Art, Illuminati, Puerto Rico, Acquire, Cosmic Encounter, I'm the Boss.

EXERCISES 6.1 - 6.3

Below the Surface: take the last article you read and list its systematic aspects (objectives, rules, procedures, resources, conflict, skills). Do this several times a week. **Game Deconstruction:** turn a journal analysis into a presentation and lead a discussion. **Board Game Analysis:** play one of the games above, analyze it, then watch a new group learn it without helping.

LESSON 2

Brainstorming best practices

Sometimes you need ideas on demand. Brainstorming is a skill with beginners and experts, like golf. Disney's Imagineers say the key is asking the right question: pare the challenge back to its core. Practices collected from the Imagineers, IDEO, and others:

State a challenge

"Design a game in which players must make strong alliances and then betray them." "A game with a special role for parents and children together." "A game that uses only one button." The first is a player experience goal; the others will need refining into one.

No criticism

Don't self-censor alone; don't criticize teammates. Wounded people stop contributing, "the death of creativity." Use the "yes, and" rule: start every contribution with those words so you build on others.

Vary the method

Try structures you're uncomfortable with. Let others lead. "Do not be afraid of losing control—if you are, you have already lost it."

Playful environment

Leave your desk. Bring toys: a Nerf ball, blocks.

Put it on the wall

Whiteboards and big paper get people on their feet and let the whole group see and build on ideas.

Go for lots of ideas

Aim for 100 ideas an hour. Number them so you can refer back quickly and measure output like reps at the gym.

Don't go too long

Sessions naturally die after about 60 minutes.

EXERCISE 6.4 • BLUE-SKY BRAINSTORM

Design an impossible "remote control" for a stereotypical character: door-to-door salesman, busy mother, God, superhero, or politician. First brainstorm the character (what's interesting to control? free will?), then the controller's buttons. Blue sky means anything goes.

LESSON 3

Alternate methods for generating ideas

List creation

List everything on a topic, then lists on variations. Writing free-associates and organizes at once.

Idea cards

One word per index card, mix in a bowl, draw pairs. "Nectar" + "giants" = nectar giants whose bodies smell like persimmons.

Mind map

Core idea in the center, related ideas radiate out. Map the game's verbs and the feelings attached to them. The Need for Speed: Most Wanted team did this at EA's workshop because teams often didn't share basic vocabulary.

Stream of consciousness

Write as fast as possible for 10 minutes, no editing, then read it back.

Shout it out

Same, but talk into a recorder for five minutes and transcribe.

Cut it up

Cut random words and images from a magazine and combine them into a concept.

Surrealist games

The Dadaists and Surrealists used chance to collide with the unconscious. Exquisite Corpse: each person writes a word type, folds, passes; read the poems aloud. "The exquisite corpse shall drink the new wine."

Research

The opposite of randomness. Fascinated by giant squid? Learn everything. If your game is about fishing, go fishing. Also research your target players by watching what they already play and asking what's missing.

Sidebar: Glenn Entis, the EA Preproduction Workshop

Launched in 2004 across all 12 EA studios after teams kept hitting the same warning signs: unclear design, key roles undefined, panic at the end of preproduction. Teams didn't need lectures; they needed *practice*. Each team brought 6–10 leads and its current game. Principles: do real work, learn by doing (presentations 15 minutes max), keep a fast pace (15–20 minute exercises so there's no time to argue about why you can't), and leave with a Post-it pre-pro plan. Key ideas: shared vocabulary, rapid early iteration ("make mistakes as quickly and cheaply as possible"), and prototypes that are **fast, cheap, public, and physical**. Medal of Honor's levels were blocked out in a sandbox. Burnout designer Matt Birch acted out crashing into a lorry (a black

chair). "People are more creative, more receptive, and more productive when they're having fun."

LESSON 4

Editing and refining, and finding your "X"

After a brainstorm you have ideas but no game. Now comes Csikszentmihalyi's **evaluation** stage. Reasons to cut an idea (keep a list of the cuts for later):

- **Technical feasibility:** not possible yet, or not for your team's size and expertise.
- **Market opportunity:** no market right now. Follow trends so you can make smart creative business decisions, not to copy.
- **Artistic considerations:** you don't love it enough to work on it for years, or it doesn't stretch you. Don't rest on proven genres.
- **Business/cost restrictions:** too expensive or ambitious for the time and budget.

Schedule editing on a *different day* from brainstorming so the two don't blur.

Discuss the top 5–10 positively, narrow to **three**, then run second-level brainstorms on features and define each game's **"X"**, EA's term for the creative center, which also aligns the team, marketing, and customers. Entis splits the X into **the razor** (cuts: decides which features belong) and **the slogan** (catchy: sells). Medal of Honor's razor was "GoldenEye set in WWII on a PlayStation"; its slogan was "Prepare for your finest hour." The slogan wouldn't have guided a single design decision.

Write one-page descriptions and hold informal feedback groups with target players (Chapter 9 covers how). Keep it fluid; don't lock in or over-polish the writing.

Sidebar: A conversation with Will Wright (by Celia Pearce)

Wright designs games because he loves making things, especially dynamic models, and wants to hand players the tools to create and then watch the world react. He prefers a large **solution space** so each player's solution feels unique to them. SimCity's influences: Bill Budge's Pinball Construction Set, early flight

simulators, and system-dynamics pioneer Jay Forrester, plus 40-page-rulebook war games like Panzer Blitz. His games teach players to build a mental model of a simulation; the "overt metaphor" gets you started (SimCity is "a train set come to life," The Sims "a dollhouse"), but the deeper metaphor is gardening for SimCity and juggling or directing actors who "won't do what you want" for The Sims. His favorite game is Go: two rules, incredible complexity, like Conway's Life. When players do things he didn't plan: "To me, that feels like success."

Sidebar: Kevin Keeker, "Getting the Most out of Focus Groups"

Focus groups are good for **generating** ideas and bad for **evaluating** them. His snowboarding-game story: asking a dozen teens which punk bands to license devolves into posturing and an uneasy consensus toward the safest, most radio-friendly choices. Group discussion helps creativity by exposing differences, but social pressure makes people avoid disagreement, and "group polarization" pushes attitudes to extremes. To generate: moderate actively ("I'd like to hear from someone who feels differently"). To evaluate: survey people *individually* with concrete alternatives and explicit acceptance criteria.

LESSON 5

Turning ideas into a game

Many designers shortcut by starting from a genre's proven mechanics. That's "feature innovation," and it works commercially, but Fullerton calls existing genres **"solved problems"**: years of designers have worked out the first-person shooter. Unless you can ask new questions of a genre, stake out new territory. Start from the player experience you want; the formal structure follows.

Questions to ask: What are the rules and procedures? What actions do players take and when? What is the conflict? Are there turns? How many players? How long does a game take? Working title? Target audience? Platform, and its restrictions and opportunities? You can only guess at first; you won't know until you play.

Focus on the formal elements

A common beginner trap: getting distracted by story and characters. Keep them in mind but secondary until the formal elements are pinned down. To flesh out structure: define the goal and win condition; write down the *single most important player action* and how it works; outline only the most critical rules and procedures; map a typical turn or core loop with a flowchart; define player count and interaction. This is already the start of prototyping.

EXERCISES 6.5 - 6.8

Exquisite Corpse: play the word version with a group. **Do It:** gather a team, state a challenge, and generate 100 ideas in 60 minutes. **Describe Your Game:** one or two paragraphs on the essence of your idea, including your X (razor and slogan). **Write a Treatment:** expand it to three to five pages: who it's for, what makes it appealing, the formal and dramatic structure. It's a draft.

LESSON 6

Feature design and experimental games

Designing new features for existing games is what entry-level designers actually do, and it makes a good portfolio piece. Student examples: Battle for Middle Earth 2's "Self-Made Man" (veteran units become mortal heroes); Battlefield 2's "Stealth Pack" (fast camouflaged agents on special mission maps); Karaoke Revolution's "World Party" (record with EyeToy, upload, get judged online, win tournaments). Explain a feature with a **storyboard**: edited screenshots showing each screen state, assembled in PowerPoint with light text, then presented. This forces you through the hard problems: "There is a big difference between an idea and a design." An idea is a loose concept; a design is a detailed plan.

Her closing push: most beginners borrow from successful games, which is fine, but the designers we admire break conventions. Don't rely only on new technology; board games haven't technically advanced in 200 years yet keep advancing conceptually, and some of the most inventive digital games ran on "primitive" systems. Limits focus ideas.

Sidebar: Richard Lemarchand, "Experimental Gameplay"

Experimental games try to do something new or make a design discovery, revealing new mechanics, play patterns, or genres. Examples: Katamari Damacy, Rod Humble's *The Marriage* (abstract shapes about his marriage), Jason Rohrer's *Passage* (a lifetime in a few minutes), *World of Goo*, *Braid*, *Osmos*, *Dear Esther* (began as a *Half-Life 2* mod), *Johann Sebastian Joust* (a "digital contact sport" with no screen), and thatgamecompany's *Cloud*, *fOw*, *Flower*, and *Journey* from USC. Inspiration from other arts: Satie and Stravinsky caused riots, Impressionists were insulted, Dada and Surrealism reacted to World War I, Beat cut-ups, Fluxus, John Cage's chance music, punk. Ask: what makes you angry or hopeful? What has a game never tried?

Beating the "blank sheet of paper problem": pick an almost random subject (roll dice on a list, or hit Wikipedia: Random), then explore it thoroughly and follow where the game leads. Peter Brinson's trick: take one formal element and exclude it, as *Tale of Tales* did in *The Graveyard*. Finish your game; commit to friends; game jams like Global Game Jam and Ludum Dare help.

LESSON 7

Designer Perspective: Josh Holmes (*NBA Street*, *Halo 4*, *Midwinter*)

Started remixing family board games as a kid, got in as an EA tester, and led *NBA Street*. Inspirations: Sid Meier's *Pirates!* (nonlinear narrative, agency), *Doom*, *Halo* (sandbox AI), *Ico* and *Journey* (emotion through abstraction), *GTA* and *Skyrim*. Process: formulate a vision statement and a few **pillars**; when an idea fits, prototype it fast so people can get hands-on before greenlighting; in production, constant "Kleenex testing" with fresh players. Prototype with whatever is simplest to prove the idea. Proudest of *Halo 4*: took over a beloved franchise with a new studio while everyone said they'd fail. Advice: "Start designing and building games. Today!" Put aside ego, embrace empathy.

EXERCISES 6.9 - 6.10

Think of a feature you'd add to a favorite game, however far-fetched. Then storyboard it visually, step by step, as a player using it successfully, and present it for critique.

Check yourself

answer key marked with ✓

Csikszentmihalyi's five stages of creativity, in order?

Insight, preparation, evaluation, incubation, elaboration

✓ **Preparation, incubation, insight, evaluation, elaboration**

Brainstorm, prototype, playtest, revise, ship

Why: And it's recursive, not linear. Elaboration is the longest and hardest stage.

What's the "yes, and" rule?

Always agree with the team leader

Say yes to every feature request

✓ **Start each brainstorm contribution with "yes, and" so you build on others' ideas instead of criticizing**

Why: It keeps the flow going and stops wounded teammates from shutting down.

How many ideas per hour does Fullerton suggest aiming for, and how long should a session run?

✓ **About 100 ideas; roughly 60 minutes**

10 great ideas; all day

3 ideas; 15 minutes

Why: Quantity over quality during the brainstorm. Number them. Energy dies after about an hour.

Why schedule editing on a different day than brainstorming?

So the team can rest

✓ **So evaluation doesn't creep into and kill the free-thinking brainstorm**

Because editing takes a week

Why: Blurring the two phases decreases brainstorm productivity. Time between also lets people form favorites.

The "razor" half of a game's X...

Goes on the box to attract buyers

Is the game's logo

✓ **Cuts: it lets the team decide which features belong and which don't**

Why: "GoldenEye set in WWII on a PlayStation" was a great razor and a bad slogan. "Prepare for your finest hour" was the reverse.

What does Fullerton mean by calling existing genres "solved problems"?

✓ **Designers have already worked out their gameplay issues, so new territory offers more room to innovate**

Genres are perfect and should be copied exactly

Nobody plays genre games anymore

Why: Feature innovation within a genre is fine and common, but she pushes you to start from the player experience and let structure follow.

According to Kevin Keeker, focus groups are...

The best way to evaluate which ideas are good

✓ Good for generating ideas, poor for validating them; evaluate with individual surveys instead

A waste of time in all cases

Why: Group polarization and social pressure distort evaluation. Give individuals concrete alternatives to rank.

Build it out of paper first. Sketches, not blueprints.

About 25 minutes • 8 lessons • 8 check questions

BIG IDEA

A prototype is a working model that tests one idea cheaply. Physical prototypes keep you focused on mechanics, let you iterate in minutes, and let everyone on the team contribute. Build your own in four steps: foundation, structure, formal details, refinement. Add rules one at a time and trust your testers.

LESSON 1

Why physical prototypes

Prototyping is "the creation of a working model of your idea that allows you to test its feasibility and make improvements to it." Prototypes are playable but rough, like sketches. Types include physical, visual, video, and software; one project may need several, each answering a different question. This chapter is about pen, paper, cards, and dice (Chapter 8 covers digital).

Benefits of physical prototyping:

- **Focus on gameplay, not technology.** Once teams start programming they get attached to their code and changes get hard. On paper, "Don't like the turn structure? Just change it and try again."
- **Respond in real time** to player feedback, incorporating ideas on the fly.
- **Nontechnical teammates participate** at a high level, widening perspectives.
- **Broader, deeper experimentation** because it costs almost nothing.

Use stick figures. Spending time on art slows you down and makes you reluctant to change things, which is counterproductive in a process that's all about change.

Three worked prototypes: Battleship, Up the River, an FPS

Battleship

Four sheets with 10×10 grids labeled A–J and 1–10: an Ocean Grid and a Target Grid per player. Each player draws five ships (carrier 5, battleship 4, destroyer 3, submarine 3, patrol boat 2, no diagonals). Call coordinates ("B5"), hear "hit" or "miss," mark with colored beads. The paper version's experience is "almost identical" to the Milton Bradley product, and once it's in your hands you start asking "What if I made the grid bigger?" and can test it in seconds.

Many famous digital games came from paper: Diablo, Baldur's Gate, EverQuest, and World of Warcraft descend from Dungeons & Dragons; the computer Civilization came from Avalon Hill's board game.

Up the River (a controlled design exercise)

A Ravensburger children's game she has run with hundreds of students. Ten board pieces form a river; the bottom piece is the *sandbar*, the fifth is *high tide*; a harbor card at the top has 12 numbered docks. Each player has three boats on the fourth piece. Roll a die, move one boat. Land on the sandbar and you stop until next turn; land exactly on high tide and advance three more. Score is the sum of your docks. Two twists make it interesting: the **waterfall** (after each round, the bottom piece moves to the top; boats on it are lost, so every move risks your other boats) and **good wind/ill wind** (roll a 6 and choose: move one of your boats up to join your next boat, or push an opponent's boat down to their nearest boat). That choice, act for yourself or against an opponent, is the interesting moment of player interaction.

Analyze it: board size vs. die faces? Boats vs. starting position? Why does the sandbar sit where it does? Skill or chance? Why does the youngest go first? Who's the market? Then set a **player experience goal** before changing anything ("resolved by strategy rather than chance," "teams with special roles," "more negotiation"), plus a dramatic metaphor. Student variations became a mountain-climbing teamwork game, a sea rescue, and a parking game.

A first-person shooter on paper

Yes, you can prototype Quake. A paper FPS won't capture running and aiming in 3D, but it will teach you weapon balance, territory, and level design. Hex graph paper is the arena (hexes allow diagonal movement); red chits mark **spawn points**; matchsticks make movable walls. How many hexes, spawn points, walls? "Take your best guess. There is no way to know what will work until you play." Units are coins with arrows showing facing. Each player gets nine cards: Move 1, 2, 3, 4 (one each), Turn (2), Shoot (3). Each round: build a face-down stack of three cards; reveal the top; resolve shoots (a straight line from facing; walls block; simultaneous), then turns, then moves (die roll breaks ties; no sharing a cell); repeat for cards two and three. Shot units respawn next round. Additions to try: score to 10 kills, hit percentage (100% adjacent, -10% per hex, roll a d10), five hit points, first-aid hexes, 10 rounds of ammo and ammo hexes, weapon pickups, alternative objectives like rescuing NPCs.

Her perspective: physical prototyping doesn't replace the sensory feel of a 3D game, but it builds the structure and forces you to define elements. And it's the best way to explain a never-seen-before game to a new team of programmers: hand them something they can play.

EXERCISES 7.1 - 7.6

Modify Your Prototype: change three aspects of Battleship, play after each, describe the effect. **Up the River Variation:** set an experience goal, change the system, test with friends. **Movement and Shooting:** invent your own FPS rules before reading hers. **Build It Yourself:** build the FPS prototype and note problems and questions. **Features:** add the suggested features and record how each changes play. **Working Backward:** strip two RTS games (StarCraft II, Age of Empires IV) to what they share, then put those core mechanics on paper.

LESSON 3

Sidebar: Chaim Gingold, "Catastrophic Prototyping and Other Stories"

Gingold (Spore Creature Creator) looked at 12 years of unfinished software and saw a hard drive full of failures. Then he read Chris Crawford, who treated failures as

prototypes that decide which ideas deserve pursuit, and saw Ken Perlin's endless small "toys" as an artist's sketches and studies. His attitude flipped: "the difference between practice and failure is simply a matter of attitude." At Maxis he found The Sims had been prototyped in isolated pieces (animation system, needs AI, house editor) hacked onto the SimCity 2000 engine. His two classic mistakes: eyes bigger than his stomach (ambitious projects without proving the core ideas first: "You can't send a rocket to the moon if you haven't first experimented with launching simple toy rockets"), and the wrong success function (his small "failures" were the real successes). Rules of thumb:

- **Always ask a question** with a hypothesis ("flocking will make the fish move together"). Diagram it on paper first.
- **Stay falsifiable.** Validate with others. Overprotective owners explaining away feedback is how cool ideas die.
- **Persuade and inspire.** Nobody believed rolling a sticky ball would be fun until they played Takahashi's Katamari prototype.
- **Work fast.** Minimize time to first "failure." Ideal window: two days to two weeks. Don't build an engine first.
- **Work economically.** Small and beautiful. Ask what the prototype is for and invest only there.
- **Carefully decompose problems.** Like a Go player cutting stones into weak groups. Prototyping everything at once is just building the game.

LESSON 4

Prototyping your original idea: visualize the core gameplay

Designing everything at once is overwhelming. Isolate the **core mechanic**, "the actions that a player repeats most often while striving to achieve the game's overall goal," and build out from there. Games are repetitive by nature; meaning changes but core actions persist. Examples: WarCraft III (build and move units to destroy opposing units), Monopoly (buy and improve properties to charge rent), Diablo III (battle, loot, explore to grow powerful), Super Mario Bros. (walk, run, jump past obstacles gathering treasure), Bomberman (move through a maze dropping bombs by opponents).

Diagram it. Activision's analysts diagrammed Spider-Man 2 (challenges, exploration, and rewards all flow into points spent at the Spidey Store) against the far more complex True Crime, noting "more complex designs do not always make for a better player experience." A rough sketch on a whiteboard is enough to expose features that aren't integrated with the core, and to spot feedback loops throwing things out of balance.

EXERCISES 7.7 - 7.8

Sketch the core gameplay of two or three games you know. Then diagram your own idea from your treatment; guess where you're unsure.

LESSON 5

Building the prototype: four steps

1. **Foundation.** Build a representation of the core gameplay from cardboard, paper, glue, and pens. Questions will flood in (how many squares? how is conflict resolved?); put them on the back burner. Design the basic objects and the repetitive key procedures. Play it alone. Add a rule only if absolutely necessary; keep the core to as few rules as possible. For the FPS, the foundation was simultaneous movement via revealed cards.
2. **Structure.** Prioritize what's essential and build the skeleton that will support later features. For the FPS: move distances, turning, hit/miss. Then scoring and hit points, retested. Know the difference: **rules** change how the game functions (win conditions, turn order); **features** make it richer (more weapons, vehicles). "You can add rules without adding features, but you can never add a feature without changing or adding rules." One laser gun can mean ten new rules. Rules first, features later.
3. **Formal details.** Add the rules and procedures needed for a fully functional game. Beginners add too much; the art is paring feature ideas down to a small set that serves your experience goal. Her litmus test: isolate each new rule, test it, remove it, test another. If you can keep building without a rule, leave it out for now. For the FPS she added hit percentage, health, and scoring and scrapped mines, shields, vehicles, and hiding.

4. **Refinement.** Now the system flows and you stop questioning fundamentals and ask "Is it compelling?" Bring back the great feature ideas (mines, teleport pads), but rank them by necessity and add one at a time, testing each, then removing it, or you'll lose your grasp of what the game is about. Write an analysis after each twist. "You might love a rule or feature so much that you are blind to its flaws. Trust your testers."

Keep refining your gameplay visualization as relationships change so you can see activities with little payoff or ones that are overvalued.

LESSON 6

Making it better, and moving beyond paper

Your prototype may be unbalanced, conflicting, slow. Before scrapping it, strip back to the core mechanics and reintroduce rules one by one to isolate what's breaking the system. Rip apart and rebuild as often as needed. And when you're "absolutely certain that your prototype is both playable and fun, then you are ready to start all over again." Good isn't brilliant.

The physical prototype becomes the blueprint for a software prototype. The FPS arena, spawns, ammo, and first aid transfer directly; programmers replace the card system with real-time movement. The new challenges are controls and interface for the target platform (Chapter 8).

Sidebar: Richard Garfield, "The Design Evolution of Magic: The Gathering"

1993 notes. Magic's ancestor is Cosmic Encounter (aliens with unique powers, endlessly new), combined with Garfield's old idea of a deck that changes between rounds, childhood marbles trading, and Strat-O-Matic Baseball drafting. Wizards of the Coast couldn't publish his board game RoboRally but wanted something quick and portable for conventions, so he built on an older card game (Five Magics). The big design worry was "rich kid syndrome": buy ten decks and be unbeatable. The ante (play for a card) and skill were the counters, and playtesting showed an overpowered deck defeats itself because nobody will

play it. Alpha was 120 cards split between two players; beta let players trade and hunt each other; gamma added Strat-O-Matic veterans and hand-drawn art (Heal was illustrated by Skaff's foot). Playtesting found and removed "degenerate" decks (Land Destruction, Sooner-Than-Instant Death), tuned colors so no single color could stand alone, and wrestled endlessly with card wordings. The playtest group became a real economy with arbitrage, price fluctuations, and trade embargoes. Dominia, a multiverse, let any card fit. Each deck is like a character; the designer acts as gamemaster of a game played among tens of thousands.

2003 retrospective. He insists on "trading card game," not "collectable": good games last, collectables come and go. Early speculation inflated \$3 boosters to \$20 and threatened to price out new players until the Fallen Empires set burst the bubble. Rather than making cards ever more powerful or launching new games, they invented tournament **formats** using only recent sets. Trading card games aren't board games: they need shorter play and a universal rules standard. The Pro Tour made everyone better ("now I am mediocre at best"). Magic Online used the same buy-cards model to target lapsed players.

LESSON 7

Designer Perspectives: James Ernest and Katie Salen

James Ernest (Cheapass Games: Kill Doctor Lucky, Lords of Vegas)

Loves simple games, especially poker: simple rules, deep strategy, short hands. Contrary to designers who invent mechanics first, he settles the **theme first** if the game will have one, because a good theme suggests mechanics you'd never have considered. Prototypes everything on paper, even computer games, and models real elements (Lego pirate ships for a miniatures game). Diceland took six years: each character is an eight-sided paper die whose faces are states. Advice: don't get so attached that you can't be honest; "become addicted to simplicity" (it's tempting to fix with more rules; better to remove bad ones); don't

use seven cards because your favorite game does; "Write the game you want to play."

Katie Salen (Rules of Play, Quest to Learn, Big Urban Game)

Got into games studying how Texas Lottery tickets work as social interfaces.

Favorites: Rez, Mafia, Guitar Hero, four square, DDR. Inspired by moments like Ico's hand-holding and the egalitarian structure of the New York Marathon; as a former volleyball player she designs for mutual respect between players.

Process: define exactly what she wants a player to experience, feel, and physically do, then prototype core mechanics on paper before embedding them in a larger system. Some games start with an image: the Big Urban Game began with giant bowling pins wandering a city. In that five-day race between three teams, she, Frank Lantz, and Nick Fortugno added a giant-dice "power-up" at checkpoints so trailing teams could catch up and every day stayed dramatic.

EXERCISE 7.9 · PROTOTYPE YOUR OWN GAME

Paper-prototype the idea from your treatment using foundation, structure, formal details, refinement. It's hard. When stuck, take your best guess and iterate.

Check yourself

answer key marked with ✓

Why does Fullerton say to keep artwork crude in early prototypes?

Art is unimportant to games

✓ **Polishing slows you down and makes you attached and reluctant to change things**

Playtesters prefer stick figures

Why: The process is about iteration and change. Attachment is the enemy of iteration.

In Up the River, what does the "waterfall" rule add?

A faster race

A second die

✓ **Conflict: every move must weigh which of your other boats is at risk of being swept away**

Why: The bottom board piece moves to the top each round, and boats on it are lost. A dice race becomes a dilemma.

What can a paper FPS prototype teach you, and what can't it?

✓ **It teaches weapon balance, territory, and level design; it can't capture running and aiming in real-time 3D**

It teaches nothing useful about shooters

It perfectly replicates the digital experience

Why: One game can have many prototypes, each answering different questions.

The four steps for building a physical prototype are...

Brainstorm, art, code, ship

Concept, story, levels, polish

✓ **Foundation, structure, formal details, refinement**

Why: Core gameplay with minimal rules, then the essential skeleton, then the rules that

make it complete, then features one at a time.

Which statement about rules and features is correct?

You can add features without changing rules

✓ **You can add rules without features, but never a feature without changing or adding rules**

Rules and features are the same thing

Why: A new laser gun needs rules for use, damage, and interactions. Rules first, features later.

Chaim Gingold's ideal window for a prototype?

✓ **Two days to two weeks**

Six months

One hour

Why: Anything longer "sets off alarm bells." Minimize time to your first failure.

What does the "core mechanic" mean?

The game's most expensive feature

The story's main conflict

✓ **The actions a player repeats most often while pursuing the overall goal**

Why: Games are repetitive by nature. Isolate the core, diagram it, and build out from there.

How did Magic's playtesting address "rich kid syndrome"?

By making all cards equally powerful

✓ **Through the ante and skill, and by discovering that overpowered decks defeat themselves because nobody will play them**

By banning trading

Why: Garfield also found that homogeneous card power doesn't work because players only use the best cards.

The single most important thing a designer does, and the one they understand least

About 25 minutes 8 lessons • 8 check questions

BIG IDEA

Playtesting is how the designer learns how players actually experience the game. Recruit the right testers, run a scripted session, shut up and watch, take notes, and take criticism without defending. Test from day one, not at beta.

LESSON 1

What playtesting is and isn't

People think playtesting is "just play the game and gather feedback." It actually involves selection, recruiting, preparation, controls, and analysis. It is **not**:

ACTIVITY	WHAT IT IS
Internal design review	The designer and team play and talk about features
QA testing	Quality assurance rigorously checks the software for flaws
Focus group testing	Marketing execs behind a mirror asking a sample group what they'd pay
Usability testing	Systematic analysis of mouse and eye movements, navigation patterns
Playtesting	What the designer does throughout the process to gain insight into how players experience the game

Halo 3 got over 3,000 hours of playtesting with 600+ players. Your game might get 10 or 20 testers in a garage. Both count. The designer stays the player's advocate through the whole long production, and the testing cycle gets tighter as it goes so you're fixing smaller issues, not fundamentals, at the end. Waiting until beta to test

"is really too late to make any fundamental changes"; if the core isn't fun by then, you're stuck with it.

LESSON 2

Recruiting playtesters, stage by stage

Self-testing

You are the best tester during the foundation stage; it's how you find the core mechanics. Learn to play with a "fresh" mind, as naively as you can. You'll rely on it less as the game matures.

Confidants

Friends and colleagues not on the design team, once the prototype is playable. Get to a version people can start without your intervention (write full rules). Then wean yourself: friends are too harsh or too forgiving because of their relationship with you.

Strangers

Only outsiders with nothing to gain or lose give the fresh perspective you need. Recruit from high schools, colleges, clubs, churches, user groups, online posts, a notice in a game store. Screen for people articulate enough to convey opinions. Ask about hobbies and what games they buy.

Target audience

The ideal tester spends their own money on games like yours. They give relevant feedback, compare to other games, and know what they like "in excessive detail." Recruit a diverse spread across your audience.

Worried about idea theft? Use an NDA if you like, but "do not be paranoid": 99.99% of people have no intention of stealing your idea and couldn't do anything with it. Bring back your most articulate testers later to gauge progress.

EXERCISES 9.1 – 9.3

Playtest your own prototype and start a playtesting notebook. Give it to confidants and observe without leading questions. Then recruit strangers from your target audience and schedule a session.

Conducting a session

Common mistake: telling testers about your game, how it works, your hopes and dreams. Once you explain, you can never see their natural first impression. Her line to students: "You don't come in the box." You are an investigator and observer, not the designer. Let them make mistakes; you learn more from mistakes than from flawless play. Ideally someone objective runs the test while you watch. Otherwise, write a **script** to control your urge to talk:

SECTION	TIME	WHAT HAPPENS
Introduction	2-3 min	Welcome, thank them, explain the process, disclose recording or observers
Warm-up	5 min	What games do you play? What do you like? Where do you find games? Last purchase?
Play session	15-20 min	"We're testing the game, not your skill." Ask them to think out loud : "I think this is the inventory button... oh, it's not." Longer than 20 minutes and they tire.
Discussion	15-20 min	Overall thoughts? Learn quickly? What's the objective? How would you describe it to a friend? Anything confusing? Walk me through it.
Wrap-up		Thank them, keep contact info, maybe a T-shirt

The hardest part: **listening without responding**. You're attached; it's natural to get defensive. Ignore your ego, write criticism down, don't answer it. Testers want to please you, and if you lead them they'll tell you what you want to hear, which makes you feel like a genius and makes the game no better. Better bad news now than from a critic later. In groups, one vocal tester can sway the rest; set etiquette up front (respect opinions, no criticizing other testers). Before taking offense, ask if you're being too sensitive. The same rules make a production team safe and productive.

EXERCISES 9.4 - 9.5

Write a script for your session that addresses your open design questions without leading. Then run the session and record everything in your notebook.

LESSON 4

Methods, the play matrix, and taking notes

Methods of playtesting

Professional usability is usually individual because groups are good for generating ideas and bad for evaluating them, but use what you have: **one-on-one** (watch over the shoulder), **group** (best for physical prototypes), **feedback forms** (quantitative; SurveyMonkey or Excel), **interview** (a verbal quiz), **open discussion**, and **metrics** (Zynga collects data on every session). Combine them: play together, discuss as a group, then fill out forms individually. "You will be surprised how differently people respond when there is no group dynamic."

The play matrix

Fullerton's tool for giving testers a vocabulary. Horizontal axis: **skill** ↔ **chance**. Vertical axis: **mental calculation** ↔ **physical dexterity**. Chess: far left (pure skill), top (pure mental). Blackjack: right of center, top. Patterns: many video games sit lower-left (physical + skill), board games and turn-based games upper-left (mental + skill), gambling upper-right (mental + chance), young kids' games lower-right (physical + chance). Ask testers to plot your game and say which quadrant they'd move it toward. To move from chance to skill, replace dice with cards the player chooses, or let players pick a starting point or weapon instead of randomizing.

Taking notes

You will remember only the comments you expected or wanted to hear. Date every test and file notes chronologically. Her form has **in-game observations**, **in-game questions** ("Why did you move there?" "Why are you pausing?"), **post-game questions** grouped by general impressions, formal elements ("What was the most important decision you made?" "Did you find any loopholes?"), dramatic elements ("Graph your emotional involvement over the game"), procedures/rules/interface ("Did anything feel clunky?"), and end of session ("If you could change one thing?"

"Who is this for?"), plus **revision ideas**. Write your own questions targeting your game's real issues, rank them, and don't exhaust testers with 20 in a row.

EXERCISES 9.6 – 9.7

Plot The Last of Us or Call of Duty, then Twister, then Monopoly or Clue on the play matrix and compare. Then plot five favorites. What does the pattern say about you?

LESSON 5

Usability techniques, data, and control situations

Three techniques from usability labs: **do not lead** (if they ask a question, ask what they think they should do; an impasse is a finding); **remind testers to think out loud**; and gather **quantitative data** with feedback forms to prioritize severity.

Professional labs produce better results and you can borrow their methods.

Data gathering: time to read the rules, clicks to perform a function, speed of leveling, 1–10 ratings. Match the data to the problem: clunky start means measure time per procedure; not dramatic enough means ask qualitative questions. Write your hypothesis first, then structure the test to confirm or deny it. Tools like Unity's analytics track engagement after launch. **Heat maps** show where players die or explore. Eye tracking, skin response, and heart rate measure excitement. But stats mislead: new testers play inefficiently, veterans have fixed habits, and physiological data is open to interpretation. Metrics complement, never replace, the designer's judgment.

Test control situations

Force players into a specific part of the mechanics: the endgame, a rare random event, a new feature, a particular level. Want to test Monopoly's jail? Start mid-game with a player already in jail, play 30 minutes, then repeat with a different financial position. Start a game near the end and test the finale four times an hour. Make one player grossly overpowered and see what happens. This is why **cheat codes** exist: RTS designers turn off fog of war to watch the AI or grant infinite resources to test maximum units, and developers traditionally leave them in for players to experiment.

EXERCISES 9.8 – 9.9

Define three quantitative measurements that answer three clear questions about your prototype. Then create three test control situations, describe their purpose, run them, and note what you observe.

LESSON 6

Playtesting practice: Connect Four

It's easier to learn playtesting on a game you have no emotional stake in. Draw a 7 × 6 grid, two pens, a stopwatch. Prepare questions and a script, recruit two testers, and play a few times, timing each game. Then vary one thing at a time:

- **Grid size:** 9 × 8. What happens to the experience and the time to resolve? Which is more interesting?
- **Objective:** back to 7 × 6, but connect five. Does the grid now feel too small? Try five on 10 × 8.
- **Turn procedure:** two units per turn in different columns. How do strategies change? Still balanced?
- **Number of players:** three players, three colors. How do strategy and social dynamics change?

LESSON 7

Four sidebars on why people play and how to test

Nicole Lazzaro, "Why We Play Games": the 4 Fun Keys

XEODesign watched players' faces and found four playstyles, each unlocking different emotions. Best-sellers (Bejeweled, WoW, Halo, Diner Dash) offer three of the four, and players rotate between them in one session.

- **Hard Fun:** challenge and mastery. Its key emotion is *fiero*, personal triumph over adversity, which requires frustration first: get the player almost ready to

quit, then let them succeed. Difficulty must rise to match skill, ideally with new strategies rather than more obstacles.

- **Easy Fun:** exploration, fooling around, curiosity, the "bubble wrap of game design." Driving the track backward, putting Sims in the pool and removing the ladder. Players use it to cool off from Hard Fun.
- **Serious Fun:** playing with a purpose: DDR to lose weight, Brain Age, blowing off frustration at the boss. Rhythm and collection mechanics create value; swapping jewels feels different from swapping broken glass and droppings.
- **People Fun:** "People are addictive, not the game." Amusement, schadenfreude, naches (pride when someone you helped succeeds), love. People in the same room express more emotion. Players play games they don't like to be with friends.

Seven emotions you can read in a face: anger, fear, disgust, happiness, sadness, surprise, curiosity. Emotions focus attention, aid decisions, affect performance, and reward learning. Plan an emotion profile at the start of design, then prototype and test against it.

Bill Fulton, "How Feedback from Typical Gamers Can Help Avoid Disappointing Outcomes"

Most games disappoint their developers. The usual explanation is that teams are too close to their work. Fulton's alternative: developers know so much more about games than typical gamers that what's fun for them isn't yet fun for the audience. Focus tests come too late and aim at selling, not improving. Age of Empires 2 aimed to be playable by someone who'd never played a computer game. In the final tutorial test, a woman in her 70s or 80s showed up an hour early. After the tutorial she built a semblance of a nation, hid her villagers when the Mongols came, and got overrun. She said it wasn't her "cup of tea," but she *understood* it, a dramatic improvement over the original, where experienced gamers got stuck. AoE2 sold dramatically more.

Eric Zimmerman and Nathalie Pozzi, "A Primer for Playtesting: Don't Follow These Rules!"

Rules A–Z for playtesting anything (theater, architecture, installations, games).

Before: playtest before you think you're ready (if you feel comfortable presenting, you waited too long); strategize so you can test today; know the one key question; prepare variations (change only one element); be grateful; design the learning experience; blame yourself, not the testers; know your testers; don't explain; take notes on a prepared sheet. **During:** be selfish (it's not for their fun); encourage talking aloud; notice everything; **shut up** ("not just a little, but really, completely"); see the big picture (body language, emotion); don't fear data; answer a question with a question; hunger for failure (beware "happy face syndrome"). **After:** discuss, concrete questions first; put feedback in context (nonexperts are the patient, you're the doctor: "make the room bigger" means "it feels small"); collaborate with testers; face the cruel truth; embrace the unexpected; the playtest process matters as much as the project. Y and Z: break these rules and invent your own.

Dennis Wixon, "Metrics in Game Design" and the Crackdown case

The riskiest assumption is that users will respond as the team does. **Behavioral** metrics measure what people do (percent who solved a puzzle, time to a hint); **attitudinal** metrics measure what they report (rate the difficulty, then the open-ended "what made it easy or hard?"). "Operationalizing" a concept means defining exactly how you'll measure it, so the team's intention and the players' performance both become explicit. Crackdown first scored 3.8 of 5 on fun, about average. Open-ended answers kept mentioning "agility orbs"; cross-tabs showed players with more orbs rated the game more fun. Recommendations: more orbs early, clearer cues, taller buildings early. The score rose to 4.2. For the demo they found fun peaked three hours in, so they accelerated skill advancement to reach that point in 30 minutes: 4.5, one of the highest ever. Lessons: metrics need a baseline for comparison; qualitative and quantitative work together; behavioral data per user enables the cross-tab.

LESSON 8

Why this chapter matters for your projects

Your course has playtesting days for the Analog Adaptation (10/14 and 10/19), the Micro-RPG (11/2 and 11/4), and the Final Project (11/23, 11/30, 12/2), and the final playtest asks you to use "a formal methodology you have not yet tried." That's this chapter: scripts, think-aloud, feedback forms, the play matrix, control situations, and metrics. Pick a different one each time.

Check yourself

answer key marked with ✓

The design team playing the game and discussing its features is...

Playtesting

Usability testing

✓ An internal design review, not playtesting

Why: Playtesting is about gaining insight into how *players* experience the game. QA, focus groups, and usability are also different things.

Why must you eventually stop relying on friends and family as testers?

✓ Their relationship with you obscures objectivity; they're too harsh or too forgiving

They might steal your idea

They don't play games

Why: Strangers from your target audience have nothing to gain or lose by being honest.

"You don't come in the box" means...

Package the rules with the game

✓ **Don't explain your game to testers; you won't be there to explain it to real players either**

Ship the game without a manual

Why: Once you explain, you can never recover their natural first impression.

How long should the play portion of a session last, and why?

An hour, to see the whole game

Five minutes, to save time

✓ **15–20 minutes; longer and testers get tired**

Why: Followed by 15–20 minutes of discussion. Use control situations to reach later parts of the game.

On the play matrix, where does chess sit?

✓ **Top left: pure skill, pure mental calculation**

Bottom right: physical and chance

Center

Why: Horizontal axis is skill vs. chance; vertical is mental vs. physical. Blackjack sits top, right of center.

Why do cheat codes exist, according to Fullerton?

To make games easier to sell

✓ They're tools developers use to set up test control situations, like turning off fog of war

Players demanded them

Why: Control situations force rare events so you can test them repeatedly. Developers traditionally leave the codes in.

Which Fun Key produces "fiero"?

Easy Fun

People Fun

✓ **Hard Fun**

Why: Fiero is triumph over adversity and requires frustration first. Easy Fun brings curiosity; People Fun brings amusement and naches.

In the Crackdown study, what did cross-tabs reveal?

✓ **Players who collected more agility orbs rated the game more fun, so orbs were added earlier**

Players hated the agility orbs

The game needed more enemies

Why: Behavioral data (orbs collected) matched against attitudinal data (fun rating) took the score from 3.8 to 4.5.

Games are made by teams. Here's everyone's job, and how the designer works with them.

About 20 minutes 7 lessons • 7 check questions

BIG IDEA

Know every role on the developer's and publisher's teams, partner with the leads instead of going around them, give every teammate a sense of authorship, and run meetings that actually decide things.

LESSON 1

From one person to two hundred

In the 1970s one programmer made the whole game. Space Invaders (1978) was 4 kilobytes including art and sound; Asteroids 8 KB; Pac-Man 28 KB. Today art and audio dwarf the code, production values approach film, and teams span database programmers to 3D artists. At the same time, tiny mobile teams can reach huge audiences. Even on a small team, know the roles, because you'll be doing several at once.

Publisher vs. developer. The publisher typically gives the developer an advance against royalties; the developer delivers the product, the publisher finances and distributes it. Some publishers develop in-house (Electronic Arts); some developers are owned by publishers (Naughty Dog and Media Molecule by Sony), and even then the internal team acts like a small company responsible for its own cash flow. Indies may do it all, usually with little marketing.

LESSON 2

The developer's team

ROLE

RESPONSIBILITIES

HOW THE DESIGNER WORKS WITH THEM

Game designer	Brainstorms concepts, creates and playtests prototypes, writes and updates design docs, communicates the vision, creates levels, advocates for the player	Combining roles creates conflicts of interest: a designer-programmer can't be objective about a feature that took months to code; a designer-producer must argue for spending time on gameplay while guarding the budget. EA Canada solves it with a separate "development director." Some games (The Last of Us, Journey) add a "game director" who owns the emotional arc.
Producer	Project leader: schedule, budget, resource allocation, forecasting, motivating the team, main link to the publisher. The office is the team's "United Nations."	Sit down at the start and go over the design in detail so the schedule and budget are realistic. Understand every line item almost as well as the producer does.
Programmers	Technical specs, prototypes, tools, engines, data, networking, documentation, fixing bugs with QA	Learn basic programming concepts for a common language. Never go around the technical director to a database engineer; partner with the lead. Goal: programmers asking when the next playtest is.
Visual artists	Characters, worlds, interfaces, animations, cut scenes; specialized roles like modeling, rigging, texturing	If artists loosely followed your wireframes, evaluate objectively: maybe your design was convoluted. Hire for passion for the style (don't put an orchestral percussionist in a rock band). Communicate with visual reference (she scanned 1950s fabrics for a retro space game). Partner with the art director; start criticism positively; give artists freedom.

QA engineers

Test plan, execution, recording and prioritizing issues, retesting

Help them build a comprehensive plan. Don't bristle when design features come back as bugs; they're your last line of defense. Involve QA early and they'll prioritize you in crunch.

Specialized media

Writers, sound designers, musicians, motion capture, dialogue coaches, usually contractors

Define what you need before they start (they bill by the hour). Avoid game jargon. Involving a sound designer early can transform the experience.

Level designers

Implement and invent levels in the level editor; test with the designer

A great entry path (American McGee at id). Don't micromanage; foster their creativity and they'll find combinations you never imagined.

LESSON 3**The publisher's team****Producer**

Also a project leader, but spends more time marshalling marketing and keeping executives behind the concept; approves milestones so payments flow. One step removed, so often more objective. "No one gets into the game industry because they want to make bad games."

Marketing team

Sells to buyers; strongest link to what buyers want; influences target hardware. Bring them in early, tap their data creatively, and they become a powerful ally.

Executives

Run the company. Designers tend to resent their involvement. Instead, find out what they worked on before, and if they're "ruining" the game, remember it's partly your job to communicate the vision; they may not have read your doc or played your build. Hold an open brainstorm and invite them.

QA

Decides whether to accept the build as a deliverable, which can trigger payment.

Usability specialists

Heuristic interface evaluation, user scenarios, recruiting subjects, sessions, data, recommendations. Focused on interface and controls rather than core gameplay. Bring them in early, not at the end.

User research and metrics

Track engagement after launch. Zynga has real-time monitors of daily and monthly active users and feature use. Essential once games become services.

EXERCISES 12.1 – 12.3

Recruit a Team: decide which roles you can't fill for your prototyped game and go find them. **Marketing:** design an online ad with a tag line and three or four feature call-outs; focus-group it with your playtesters. **Usability Experience:** contact a usability lab and watch or participate in a session.

LESSON 4

Team size, authorship, and building the team

Console teams may be 200 people for three years (GTA V took over five); the previous generation averaged 40 people and two years. An indie team might be five people for 18 months; a mid-sized team 40 people for 24 months. Art and programming are the largest groups at any size.

All contribute to design. Not everyone literally designs, but in a well-run project everyone can contribute their talents and feel a sense of authorship: "I worked on that." Her tips: weekly lead meetings; an open suggestion list; one-on-one creative talks; open brainstorms anyone can attend, from production assistants to QA; present stuck problems as creative challenges; and say "we," not "I."

Building the team. Talent matters, but the mix of talent and personality matters more; some brilliant individuals cause more trouble than they're worth on a team. Check track records and talk to people who've worked with them.

Sidebar: Tracy Fullerton, "Building Inclusive Design Teams"

Diversity isn't only gender, age, race, or background; it's also extroverts and introverts, casual and hardcore players. Assuming everyone shares your sensibilities means missing ideas. Two classroom exercises: **Skill sharing:** everyone writes three skills they can teach and three they'd love to learn on sticky notes worn on their shirts (C++, Maya, budgeting, fencing, surfing), mingles, and contracts with one teacher and one student for the semester. It breaks the tendency of programmers to cluster with programmers. **"Yes, and":** a card game with blue-sky goal cards ("a game that takes 30 years to play," "a game to play across generations") and phrase cards you must use when adding an idea, from "I love that idea!" and "What if we combine..." down to "no, but" and "shut down." Afterward the group discusses how the language shaped the brainstorm.

LESSON 5

Team communication, meetings, and Agile

Teams communicate laterally as well as up the hierarchy; feature teammates may talk more with each other than with their own discipline. But respect the lines: one producer on each side is the single point of contact between developer and publisher, and requests go through the technical director or art director, not straight to the individual.

Meetings. If you call one, set a definite goal and tell people in advance. If you attend, come prepared. The caller leads and keeps things on track. No one is left out; no personal attacks (warn, then remove); differences of opinion are helpful. Close by reviewing decisions and action items, schedule any follow-up, and send notes to participants and absent key members.

Agile and Scrum. Modular, adaptive, people-centric development. Scrum uses small cross-functional teams that prioritize daily and iterate in short cycles, which builds communication and suits the fluid changes hard design problems demand. Big productions organize Scrum teams around features. Chapter 13 goes deeper.

LESSON 6

Three designer perspectives

Nahil Sharkasi (Microsoft: Kinect Star Wars, Halo 5: Forge, Mixed Reality)

A former journalist who fell into games at USC's Game Innovation Lab. Loves games that blur real and virtual (Sharkrunners, where real GPS-tagged sharks drive the game). Brainstorming is "interval training for your brain": shock it with different stimuli. Process: **lo-fi to hi-fi**, a day or two per prototype, working down a prioritized list; "if you hit magic, keep going." Don't be precious: great ideas can be disastrous in a prototype and dull ones can be fun. On Kinect Star Wars, certification rules for achievements were written before Kinect existed, so the team negotiated to change them: question whether rules apply. Advice: "Make."

Matt Firor (Dark Age of Camelot, The Elder Scrolls Online)

Built a 16-player dial-up RPG as a hobby in 1992 before Mythic Entertainment. Favorites: Fallout (story), Half-Life, Wizardry (harsh permadeath made combat matter), EverQuest, World of Warcraft ("so much damn fun"). MMOs require creating a world as well as a game, from the IP outward to terrain, monsters, classes, economy, and strict rules for the game's direction. Camelot's PvP was "extremely thorny": abilities balanced against monsters break against humans.

Advice: do whatever it takes to get in the door, then be patient until people know you're competent.

Jenova Chen (thatgamecompany: fLOW, Flower, Journey)

Came from Shanghai to USC in 2003; student games Cloud and fLOW led to Sony. Grad school gave him a design vocabulary "to replace 'fun' and 'cool.'" Everybody has good ideas; very few can refine one for years into something practical. Cloud started as "can we make a game about beautiful clouds?" and became the peaceful feeling of daydreaming. Start from a feeling, not features. Prototypes are sketches; spread the net wide, and abandon a prototype you've grown too used to. "Challenging" and "relaxing" are contradictory, so he kept asking what emotion the game should evoke. Advice: there is no natural-born talent, only passion and accumulated hours; set clear goals for your own hero's journey and adjust challenges to stay in flow.

LESSON 7

Conclusion

Interpersonal skills are as important as any design skill. Take time to understand other roles, make sure they know yours, participate at the highest level, come prepared, and be the best team member you can, whether you're at the bottom or leading. There's no one right team structure; your objective is an environment where everyone can contribute their best.

Check yourself

answer key marked with ✓

In the typical publisher/developer relationship...

The developer finances and the publisher builds

✓ **The publisher advances money against royalties and distributes; the developer delivers the product**

They never communicate

Why: Even in-house teams at publishers like EA act as small companies with their own P&L.

Why is combining the designer and producer roles a problem?

Producers can't design

It's illegal

✓ **One person must advocate spending time and money on gameplay while also enforcing the schedule and budget**

Why: A natural conflict of interest. EA Canada adds a development director to take on the producer's duties.

You need a quick database change. Fullerton says...

✓ **Go through the technical director; going around them undercuts their authority and makes an adversary**

Ask the database engineer directly to save time

Do it yourself

Why: Partner with whoever leads the programming team; it's their job to communicate your ideas to the rest.

Artists only loosely followed your interface wireframes. Her advice?

Insist they follow your designs to the letter

✓ **Evaluate objectively: if they found it convoluted, players might too, but make sure features aren't lost for beauty**

Fire the art team

Why: Compromise with a skilled artistic eye can improve the design, but players won't care about beauty if they can't find the feature.

Usability testing differs from playtesting because it focuses on...

Story and characters

Sales projections

✓ **Interface and controls rather than core gameplay**

Why: Usability specialists do heuristic evaluations and task-success studies. Bring them in early, not at the end.

Which practice fosters a sense of authorship across the team?

✓ **Saying "we" instead of "I," open brainstorming, and a suggestion list**

Keeping design meetings restricted to designers

Announcing decisions after they're made

Why: Shutting people out fosters cliquishness and loses good ideas. Everyone should be able to say "I worked on that."

What is Scrum?

A rugby-based team-building game

✓ **An Agile variant using small cross-functional teams, daily prioritizing, and short iterations, often organized around features**

A publisher's QA process

Why: Short iteration and review force strong communication, which suits hard design problems.

Playing a game is the voluntary attempt to overcome unnecessary obstacles

About 10 minutes · 4 lessons · 6 check questions

BIG IDEA

Every game has four defining traits: a goal, rules, a feedback system, and voluntary participation. Games make us happy because they are hard work we choose for ourselves, and choosing hard work produces optimism, engagement, and fiero.

LESSON 1

Why we're suspicious of games

Our language treats games with wariness: "this isn't a game" means someone is being reckless. McGonigal argues these metaphors reflect our fear of losing track of where the game ends and reality begins, not what well-designed games actually do. To fix reality with games, we first need a good definition.

LESSON 2

The four defining traits

Goal

The specific outcome players work to achieve. Focuses attention and provides a sense of purpose.

Rules

Limit how players can reach the goal. By removing the obvious ways, they push players into uncharted possibility spaces, unleashing creativity and strategic thinking.

Feedback system

Tells players how close they are: points, levels, a score, a progress bar, or just "the game is over when..." Real-time feedback promises the goal is achievable and motivates continued play.

Voluntary participation

Everyone knowingly and willingly accepts the goal, rules, and feedback.

Knowingness creates common ground; the freedom to leave makes stressful, challenging work feel safe and pleasurable.

What's *not* defining: interactivity, graphics, narrative, rewards, competition, virtual environments, even winning. Those reinforce the four traits: story makes the goal enticing, scoring makes feedback motivating, achievements multiply chances to succeed, graphics sustain attention, difficulty curves redefine the goal. Bernard Suits sums it up: "Playing a game is the voluntary attempt to overcome unnecessary obstacles." Hence **Fix #1: Unnecessary Obstacles**. "Compared with games, reality is too easy."

Testing the definition

- **Golf:** you could drop the ball in the hole by hand. You agree to stand far away and swing a club. Feedback: did it go in, and how many strokes.
- **Scrabble:** spelling words with tiles is "typing." Seven random letters, building on others' words, a finite supply of each letter, and points turn it into a game 150 million people in 121 countries play.
- **Tetris:** a game you cannot win. Pieces fall faster until you fail. Beloved anyway because of intense feedback: visual (rows vanish with a poof), quantitative (score ticks up), qualitative (it feels harder). Digital games' tight feedback loop keeps you "on the very edge of your skill level," which is flow. James Carse: finite games we play to win; infinite games we play to keep playing. Tetris is infinite.
- **Portal:** you wake in a sealed room with no instructions. Your first goal is to figure out your goals; pick up a clipboard and an AI begins the "tests." Modern games often reverse the order: you learn the feedback system first, and it guides you to the goal and rules. Gamers rarely read manuals; a well-designed game is playable with no instruction.

Gamers don't want to game the system. They want to play the game: explore, learn, improve, and volunteer for hard work they care about. Which raises the question:

why are we spending 3 billion hours a week on unnecessary obstacles?

LESSON 3

How games provoke positive emotion

"Games make us happy because they are hard work that we choose for ourselves."

Brian Sutton-Smith: "The opposite of play isn't work. It's depression." Depression is a pessimistic sense of inadequacy plus a lack of activity; gameplay is the reverse: an optimistic sense of your own capabilities plus an invigorating rush of activity. It activates the attention, reward, motivation, emotion, and memory systems all at once. Real-world hard work often fails us because it's imposed, stressful, criticized, or invisible in its impact, or because it isn't hard enough and we're bored.

Seven kinds of work games offer

High-stakes work

Fast, action-oriented, with spectacular failure. Gran Turismo, Left 4 Dead.

Busywork

Predictable and monotonous, but contenting when chosen. Bejeweled, FarmVille.

Mental work

Brain Age's 30-second math, or 10,000-year Age of Empires campaigns.

Physical work

Wii Boxing, Dance Dance Revolution. Endorphins.

Discovery work

Investigating unfamiliar spaces and characters. BioShock, The World Ends with You.

Teamwork

A unique role in a bigger effort. 25-player WoW raids, Castle Crashers.

Creative work

Meaningful decisions and pride in what you made. The Sims, SingStar, Madden franchises.

Noël Coward: "Work is more fun than fun." **Experience sampling** (paging people at random to ask what they're doing and how they feel) finds that "relaxing" fun like TV, chocolate, and window-shopping leaves us feeling worse: less motivated, less confident. We reach for it to escape stress and overshoot into boredom and depression. **Hard fun** is *eustress*: physiologically identical to negative stress, but chosen, so we feel confident and optimistic. Games rank among the activities with the highest interest and positive mood during and after. Tal Ben-Shahar: "We're much happier enlivening time rather than killing time."

LESSON 4

Fiero, and "this could be a game"

Fiero is Italian for pride, adopted by designers for the rush after triumphing over adversity. Everyone expresses it the same way: arms over the head, yelling. Stanford researchers call it part of our "caveman wiring," the emotion that made us leave the cave; it lights up three reward structures in the brain, and the harder the obstacle, the bigger the rush.

Her close: a good game is a powerful tool for inspiring participation and motivating hard work, and on a network it can motivate millions at once. Everything good games can do stems from organizing us around a voluntary obstacle. Stop saying "This isn't a game." Start saying "This could be a game."

Connect it to Fullerton: McGonigal's four traits map onto formal elements (goal = objective, rules = rules and procedures, feedback = outcome and system feedback, voluntary participation = the lusory attitude and magic circle). Her "hard fun" and fiero are Lazzaro's Hard Fun key from Chapter 9, and "edge of your skill level" is Chapter 4's flow.

Check yourself

answer key marked with ✓

McGonigal's four defining traits of a game?

Graphics, story, competition, winning

Players, objectives, procedures, rules

✓ **Goal, rules, feedback system, voluntary participation**

Why: Everything else (story, scoring, achievements, graphics) reinforces those four.

Bernard Suits's definition of playing a game?

✓ **The voluntary attempt to overcome unnecessary obstacles**

A contest with a winner and a loser

Any activity done for fun

Why: Golf is his quintessential example: you could just drop the ball in the hole.

Why is Tetris so compelling even though you can't win?

It has a great story

✓ **Intense visual, quantitative, and qualitative feedback keeps you on the edge of your skill, in flow**

It's competitive

Why: It's an "infinite game" in Carse's terms: played to keep playing. Competition and winning aren't defining traits.

What does Portal show about modern games?

Games need long tutorials

Puzzles are more fun than shooters

✓ **Players often learn the feedback system first, which guides them to the goal and rules, with no manual**

Why: The four traits remain; they just play out in a different order.

"The opposite of play isn't work. It's ____." (Sutton-Smith)

✓ **Depression**

Boredom

School

Why: Gameplay is the emotional reverse of depression: optimism about your abilities plus invigorating activity.

Experience sampling research finds that "relaxing fun" like TV...

Makes us happiest

✓ **Leaves us feeling worse: less motivated and confident, sliding toward boredom**

Has no effect

Why: Hard fun (eustress) leaves us measurably better. Games rank among the highest activities for interest and positive mood.

Flashcards

Cover the answer, say it aloud, then check.

STUDY DECK

All flashcards, by chapter

INTRODUCTION

What is the game designer's role, per the Introduction?

To craft a set of rules within which there are means and motivation to play. Part engineer, entertainer, mathematician, and social director.

INTRODUCTION

The three most important skills in game design?

Prototyping, playtesting, and revising your system based on player feedback.

CHAPTER 1

The designer's role "first and foremost"?

To be an advocate for the player: see the game through the player's eyes and keep focus on gameplay.

CHAPTER 1

The party host metaphor?

You set everything up, open the doors, and see what happens. A game, like a party, is only realized when the guests (players) arrive.

CHAPTER 1

The most important designer skill?

Communication: selling the vision to teammates, management, and investors, plus listening and compromising.

INTRODUCTION

Why prototype on paper before software?

Software complexity hides the structural elements of the system. Paper lets you see what works and what doesn't.

INTRODUCTION

What does "playcentric" mean?

Designing for the player's experience, no matter the platform, by involving players from concept through completion.

CHAPTER 1

Why do you need playtesters?

You lose objectivity after months of tweaking. Playtesters give a fresh perspective and reveal issues below the surface.

CHAPTER 1

What is a player experience goal?

A description of the interesting situation or feeling you want players to have. NOT a feature. Example: "players must cooperate but can never trust each other."

CHAPTER 1

Why are games "fragile systems"?

Every element is linked. Changing one variable ripples through the whole system, so fixing one problem can create many.

CHAPTER 1

Define iteration.

Design, test, and evaluate over and over, improving each time, until the player experience meets your goals.

CHAPTER 1

What is "second-order design"? (Zimmerman)

Designers create rules, but players experience play, which only emerges when the rules are inhabited. So you must test.

CHAPTER 1

What is a game journal for?

Thinking deeply about one meaningful moment of gameplay: what you felt, chose, and which mechanics made it work. Builds game literacy.

CHAPTER 2

What is the lusory attitude?

Bernard Suits: voluntarily accepting rules that require worse rather than better means to reach a goal (golf: hit the ball with a stick instead of placing it by hand).

CHAPTER 2

Objective vs. outcome?

All players can achieve the objective; other factors in the system decide the outcome (who wins). The outcome must be uncertain but measurable and unequal.

CHAPTER 2

Where does conflict come from?

Rules and procedures deter players from reaching goals directly, and in multiplayer games make players work against each other.

CHAPTER 2

Premise vs. story?

A premise gives context and need not go anywhere. A story has narrative qualities and unfolds with the game.

CHAPTER 1

The 7 steps of the playcentric process?

Brainstorming, physical prototype, presentation (optional), software prototypes, design documentation, production, quality assurance.

CHAPTER 1

Glenn Entis's four words for a prototype?

Fast, cheap, public, and physical.

CHAPTER 2

Name the 8 formal elements.

Players, objectives, procedures, rules, resources, conflict, boundaries, outcome.

CHAPTER 2

What is the magic circle?

Huizinga: the temporary world within the ordinary world where the rules of the game apply (the arena, card-table, stage, screen).

CHAPTER 2

Resources are...

Objects made valuable by their utility (they help reach the goal) and scarcity (the designer limits them).

CHAPTER 2

Salen & Zimmerman's definition of play?

"Free movement within a more rigid structure," like the play in a steering wheel.

CHAPTER 2

Fullerton's working definition of a game?

A closed, formal system that engages players in structured conflict and resolves its uncertainty in an unequal outcome.

CHAPTER 2

Scott Kim's definition of a puzzle?

A puzzle is fun, and it has a right answer. (Games: winning. Toys: no goal. Stories: no interaction.)

CHAPTER 2

Why is "the whole greater than the sum of its parts" for games?

Games are systems. Like a car engine, their real qualities only emerge when set in motion and can't be predicted from the parts alone.

CHAPTER 3

The 7 player interaction patterns?

Single player vs. game; multiple individuals vs. game; player vs. player; unilateral competition; multilateral competition; cooperative play; team competition.

CHAPTER 3

The 10 objective types?

Capture, chase, race, alignment, rescue/escape, forbidden act, construction, exploration, solution, outwit.

CHAPTER 3

The four kinds of procedures?

Starting action, progression of action (includes the core loop), special actions, resolving actions.

CHAPTER 3

Three jobs rules do?

Define objects and concepts; restrict actions; determine effects (if X then Y).

CHAPTER 3

Nine resource types Fullerton lists?

Lives, units, health, currency, actions, power-ups, inventory, special terrain, time.

CHAPTER 2

Why does Fullerton dislike "gamification"?

It implies layering game features (badges, points) on anything makes it fun. Players see through shiny prizes; real engagement needs deeper system design.

CHAPTER 3

Bartle's four player types?

Achievers, explorers, socializers, killers.

CHAPTER 3

Which interaction pattern is "highly undervalued"?

Unilateral competition: two or more players against one (tag, dodgeball, Scotland Yard).

CHAPTER 3

A "forbidden act" objective is...

Getting the opponent to break the rules (laugh, let go, move wrong): Twister, Operation, Ker-Plunk.

CHAPTER 3

What is the core loop?

A set of procedures that repeat throughout play to move the game forward, e.g. roll dice, move, do what the square says.

CHAPTER 3

Why "Do not pass Go, do not collect \$200"?

A rule that closes a loophole: otherwise going to jail past Go would turn a punishment into a reward.

CHAPTER 3

Three sources of conflict?

Obstacles, opponents, dilemmas.

CHAPTER 3

Zero-sum vs. non-zero-sum?

Zero-sum: one win (+1) and one loss (−1) always sum to zero (chess). Non-zero-sum: gains and losses don't cancel (WoW, co-op games, Gone Home).

CHAPTER 3

"The mechanic is the message" means...

Brenda Romero: meaning can arise purely from rules and what the player does within them. "Pure mechanic is pure player."

CHAPTER 4

Who created flow theory and what is it?

Mihaly Csikszentmihalyi. The optimal state where challenge and ability rise together, balanced between frustration and boredom.

CHAPTER 4

The paradox of control?

You can only feel in control when the outcome is uncertain and you can influence it.

CHAPTER 4

Caillois's four types of play?

Agôn (competition), alea (chance), mimicry (make-believe), ilinx (vertigo).

CHAPTER 4

Three levels of engagement?

Spectator, participant, transformational (play that changes the player's life).

CHAPTER 4

Four character questions?

What does the character want? What does the character need? What does the player hope? What does the player fear?

CHAPTER 3

What is procedurality? (Bogost)

Representing a source system through rule-based behavior in code. Video games express and persuade through procedural models.

CHAPTER 3

LeTourneau on prototypes?

"They are sketches, not blueprints." Prototypes are disposable learning tools; never try to ship one.

CHAPTER 4

The 8 elements of flow?

Challenging activity requiring skill; merging of action and awareness; clear goals and feedback; concentration; paradox of control; loss of self-consciousness; transformation of time; experience as an end in itself.

CHAPTER 4

Autotelic vs. exotelic?

Autotelic: done for its own sake (games, art, music). Exotelic: done to achieve some other goal.

CHAPTER 4

Ludus vs. paidia?

Ludus: rule-based play. Paidia: free-form, improvisational play.

CHAPTER 4

A premise's first job?

Make the formal system playable by giving abstract mechanics concrete context (shoot aliens, not blocks). Second job: emotional appeal.

CHAPTER 4

Round vs. flat characters?

Round: well-defined traits, may change (Hamlet). Flat: few traits, stereotypes used as foils (the lazy guard).

CHAPTER 4

Agency vs. empathy?

Agency: the character as the player's representation in the game. Empathy: the player's emotional attachment to the character.

CHAPTER 4

Three ways story appears in games?

Backstory (elaborate premise, unchanged by play), branching (Heavy Rain), emergent (The Sims).

CHAPTER 4

Fullerton's critique of Donkey Kong's drama?

Mario has no internal conflict and Pauline's jeopardy never increases, so formal and dramatic tension aren't fully integrated.

CHAPTER 4

Ian Dallas's two director questions?

Where are we going? (the feeling we're after) and What's most broken? (what's ruining the experience most).

CHAPTER 5

Collection vs. system?

A collection has no relationships between elements (blank index cards). Number them and you have a system; remove one and the dynamics change.

CHAPTER 5

What does 'second-order design problem' mean?

Designers can't directly determine the player experience; they craft a possibility space and must playtest to see how it plays out (Salen & Zimmerman).

CHAPTER 4

Why is story hard to integrate into games?

A story's uncertainty is resolved by the author; a game's is resolved by the players.

CHAPTER 4

Stages of the dramatic arc?

Exposition, conflict, rising action, climax, falling action, resolution (dénouement).

CHAPTER 4

What did Journey's playtests reveal?

The emotional leap from the abyss to revelation wasn't big enough; Chen's team made it twice as extreme.

CHAPTER 5

The four basic elements of a system?

Objects, properties, behaviors, relationships. Objects are defined by their properties and behaviors and by their relationships to other objects.

CHAPTER 5

WarCraft II damage formula?

(Basic Damage – Target's Armor) + Piercing Damage = maximum; attacker does a random 50–100% of that. Rules set the range; chance decides within it.

CHAPTER 5

How many cards in Set, and why?

$81 = 3^4$ (four properties, three options each). Adding a fifth property gives 243; adding a fourth option to each property gives 256.

CHAPTER 5

Mastermind vs. Clue possibility sets?

Mastermind: $6^4 = 1,296$ codes, pure deduction.
Clue: $6 \times 6 \times 9 = 324$, but dice, movement, social cues, and a murder premise make it a family game.

CHAPTER 5

Pit's economy profile?

Product fixed, no money, prices fixed, trading unrestricted (equal counts). A frenetic social excuse, not a real economy.

CHAPTER 5

Monopoly's economy profile?

Product fixed (28 properties), money supply controlled growth (\$200 per lap), market prices via auction and trades, trading unrestricted.

CHAPTER 5

Conway's Game of Life rules?

Birth: empty cell with exactly 3 neighbors. Death by loneliness: fewer than 2. Death by overpopulation: 4 or more. Emergence from simple rules.

CHAPTER 5

Four information structures?

Open (chess, Go), hidden (5-card stud face down), mixed (7-card stud, blackjack), dynamic (fog of war).

CHAPTER 5

Reinforcing vs. balancing feedback loops?

Reinforcing (positive): score a point, get a free turn; Jeopardy! board control. Balancing (negative): score, and the other team gets the ball; Catan's 7 rule.

CHAPTER 5

Dan Cook's interaction loop?

Mental model $\rightarrow$ decision $\rightarrow$ action $\rightarrow$ rules $\rightarrow$ feedback $\rightarrow$ updated mental model. Repeat until mastery. Arcs deliver content once; loops build skill.

CHAPTER 5

What must an economy have?

Items of exchange, agents of exchange, and methods of exchange. Currency is optional.

CHAPTER 5

Catan's economy profile?

Product controlled growth (dice; a 7 makes you discard over seven cards), no money, market prices capped by the bank's 4:1, trading restricted to your turn.

CHAPTER 5

What is a metaeconomy?

A market for game objects outside the game itself: Ultima characters on eBay, Magic cards, free-to-play gems in Clash of Clans.

CHAPTER 5

What is emergence?

Complex, unpredictable behavior arising from simple rules interacting: ant colonies, the Game of Life glider, Halo's AI, The Sims.

CHAPTER 5

Direct vs. indirect control?

Direct: move your character in a shooter. Indirect: change ride prices in Rollercoaster Tycoon to influence guests you can't command.

CHAPTER 5

Three things to test when tuning, in order?

Internally complete (no loopholes), fair and balanced (no dominant strategies), fun and challenging (tested with the target audience).

CHAPTER 5

Frank Lantz's one-line design process?

'Start with a fun game, put some stuff in it, then take some stuff out.'

CHAPTER 6

Csikszentmihalyi's five stages of creativity?

Preparation, incubation, insight, evaluation, elaboration. Recursive, not linear. Elaboration is longest and hardest.

CHAPTER 6

Alternate idea-generation methods?

List creation, idea cards, mind map, stream of consciousness, shout it out, cut it up, surrealist games (Exquisite Corpse), research.

CHAPTER 6

What is a game's 'X'?

EA's term for the creative center that aligns team, marketing, and customers. Two parts: the razor (cuts features) and the slogan (sells).

CHAPTER 6

Why does Fullerton call genres 'solved problems'?

Years of designers have worked out their gameplay; unless you can ask new questions, stake out new territory starting from the player experience.

CHAPTER 6

Glenn Entis's four words for prototypes?

Fast, cheap, public, and physical (from the EA Preproduction Workshop).

CHAPTER 6

Will Wright on a large 'solution space'?

Giving players many ways to solve a problem makes them care more, because their solution is unique to them. Unpredictable player outcomes 'feel like success.'

CHAPTER 6

The seven brainstorming best practices?

State a challenge; no criticism ('yes, and'); vary the method; playful environment; put it on the wall; go for lots of ideas (100/hour, numbered); don't go too long (about 60 minutes).

CHAPTER 6

Four reasons to edit an idea out?

Technical feasibility, market opportunity, artistic considerations, business/cost restrictions. Keep a list of cuts for later.

CHAPTER 6

Medal of Honor's razor and slogan?

Razor: 'GoldenEye set in WWII on a PlayStation.'
Slogan: 'Prepare for your finest hour.'

CHAPTER 6

Idea vs. design?

An idea is a loose concept you can describe verbally. A design is a detailed plan. Translating ideas into designs is the professional's skill.

CHAPTER 6

Kevin Keeker on focus groups?

Good for generating ideas, poor for validating them (group polarization). To evaluate, survey individuals with concrete alternatives.

CHAPTER 6

Lemarchand's fix for the blank sheet of paper problem?

Pick an almost random subject (roll dice, Wikipedia: Random), explore it thoroughly, or exclude one traditional formal element. Then finish the game.

CHAPTER 7

Define prototyping.

Creating a working model of your idea to test its feasibility and improve it. Playable but rough: a sketch focused on a few mechanics.

CHAPTER 7

Up the River's two twists?

The waterfall (bottom board piece moves to the top each round; boats on it are lost) and good wind/ill wind (on a 6, help yourself or hurt an opponent).

CHAPTER 7

FPS prototype action cards?

Nine per player: Move 1, 2, 3, 4 (one each), Turn (two), Shoot (three). Stack three face down; resolve shoots, then turns, then moves.

CHAPTER 7

Four steps to build a physical prototype?

Foundation (core gameplay, fewest rules), structure (essential skeleton), formal details (rules one at a time), refinement (features ranked and tested one at a time).

CHAPTER 7

Fullerton's litmus test for a rule?

Isolate it, test it, remove it. If you can keep building the game without it, leave it out for now, no matter how amazing it seems.

CHAPTER 7

Gingold's two classic mistakes?

Eyes bigger than his stomach (ambition without proving the core), and the wrong success function (his small 'failures' were the real successes).

CHAPTER 7

Four benefits of physical prototyping?

Focus on gameplay not technology; respond to feedback in real time; nontechnical teammates participate; broad, cheap experimentation.

CHAPTER 7

What can a paper FPS teach, and not teach?

Weapon balance, territory control, level design. Not the fluid feel of running, aiming, and shooting in 3D.

CHAPTER 7

What is the core mechanic?

The actions a player repeats most often while striving for the overall goal. Isolate it, diagram it, build out from there.

CHAPTER 7

Rules vs. features?

Rules change how the game functions (win condition, turn order). Features make it richer (weapons, vehicles). You can add rules without features, never a feature without rules.

CHAPTER 7

Chaim Gingold's prototyping rules?

Always ask a question (hypothesis); stay falsifiable; persuade and inspire; work fast (2 days to 2 weeks); work economically; carefully decompose problems.

CHAPTER 7

Magic's 'rich kid syndrome' and its answer?

Fear that buying ten decks makes you unbeatable. Answers: the ante, skill, and the discovery that overpowered decks defeat themselves because nobody will play them.

CHAPTER 7

Why does Garfield insist on 'trading' card game, not 'collectable'?

Collectables keep new players out through escalating prices; good games last forever. Formats using recent sets fixed the problem.

CHAPTER 9

Four things playtesting is NOT?

Internal design review, QA testing, focus group testing, usability testing. Playtesting is gaining insight into how players experience the game.

CHAPTER 9

'You don't come in the box' means?

Don't explain the game to testers. You won't be there to explain it to real players, and once you explain you lose their first impression.

CHAPTER 9

Why testers tell you what you want to hear?

You invited them; they want to please you. Lead them and they'll fall in line. Take criticism without responding; write it down.

CHAPTER 9

The play matrix axes?

Horizontal: skill ↔ chance. Vertical: mental calculation ↔ physical dexterity. Chess is top-left.

CHAPTER 9

Three usability techniques for playtests?

Do not lead (answer questions with questions), remind testers to think out loud, gather quantitative data.

CHAPTER 9

Lazzaro's 4 Fun Keys?

Hard Fun (fiero), Easy Fun (curiosity), Serious Fun (purpose and value), People Fun (amusement, schadenfreude, naches).

CHAPTER 7

James Ernest's advice?

Settle theme first if there is one; 'become addicted to simplicity'; don't copy numbers from other games; 'Write the game you want to play.'

CHAPTER 9

Stages of playtesters?

Self-testing (foundation stage), confidants (playable prototype), strangers, then target audience. Wean yourself off friends and family.

CHAPTER 9

The playtest script structure?

Introduction 2–3 min; warm-up 5 min; play session 15–20 min (think out loud); discussion 15–20 min; wrap-up.

CHAPTER 9

Six playtesting methods?

One-on-one, group, feedback forms, interview, open discussion, metrics. Combine them; people answer differently without a group dynamic.

CHAPTER 9

Which quadrants do popular game types fall in?

Video games: physical + skill. Board and turn-based games: mental + skill. Gambling: mental + chance. Young kids' games: physical + chance.

CHAPTER 9

What is a test control situation?

Forcing players into a specific part of the mechanics: the endgame, a rare event, a new feature. Cheat codes exist for this.

CHAPTER 9

Behavioral vs. attitudinal metrics (Wixon)?

Behavioral: what people do (percent who solved a puzzle). Attitudinal: what they report (rate the difficulty). Use them together.

CHAPTER 9

The Crackdown finding?

Players with more agility orbs rated the game more fun. Orbs were added earlier and cued better; fun rose from 3.8 to 4.2, then 4.5 in the demo.

CHAPTER 9

Bill Fulton's alternative analysis of disappointing games?

Developers know far more about games than typical gamers, so what's fun for them isn't yet fun for the audience. Test with real people (the AoE2 grandmother).

CHAPTER 12

The game designer's responsibilities?

Brainstorm concepts, create and playtest prototypes, write and update design docs, communicate the vision, create levels, advocate for the player.

CHAPTER 12

The producer's job?

Project leader: schedule, budget, resources, forecasting, motivating the team, single point of contact with the publisher's producer.

CHAPTER 12

How should a designer work with artists?

Communicate with visual reference; evaluate their changes objectively; partner with the art director; start criticism positively; give them freedom.

CHAPTER 12

Usability vs. playtesting?

Usability focuses on interface and controls (heuristic evaluation, task success); playtesting on core gameplay experience.

CHAPTER 9

Zimmerman and Pozzi's rule N?

Shut up. Not a little: completely. Testers' mistakes and misunderstandings are the most valuable part of the playtest.

CHAPTER 12

Publisher vs. developer roles?

Publisher advances money against royalties, finances, and distributes. Developer delivers the product. In-house teams still act like small companies.

CHAPTER 12

Why not combine designer and producer?

Conflict of interest: advocating time and money for gameplay while enforcing schedule and budget. EA Canada adds a development director.

CHAPTER 12

How should a designer work with programmers?

Learn basic programming for a common language; go through the technical director, never around them; partner with the lead.

CHAPTER 12

Why involve QA early?

They're the last line of defense; design features returned as bugs are help, not criticism; early involvement makes them prioritize your game in crunch.

CHAPTER 12

Typical team sizes?

Console: up to 200 people for 3 years (GTA V over 5). Prior generation: 40 people, 2 years. Indie: 5 people, 18 months. Mid-size: 40 people, 24 months.

CHAPTER 12

Ways to foster authorship on a team?

Weekly lead meetings, an open suggestion list, one-on-one creative talks, open brainstorm for anyone, present problems as challenges, say 'we' not 'I'.

CHAPTER 12

What is Scrum?

An Agile variant: small cross-functional teams that prioritize daily and iterate in short cycles, often organized around game features.

CHAPTER 12

Nahil Sharkasi's prototyping approach?

Lo-fi to hi-fi: a day or two per prototype, work down a prioritized list, and if you hit magic keep going. Don't be precious.

REALITY IS BROKEN

Bernard Suits's definition of playing a game?

'The voluntary attempt to overcome unnecessary obstacles.' Fix #1: compared with games, reality is too easy.

REALITY IS BROKEN

What does Portal show about learning games?

Modern games often teach the feedback system first, which guides you to the goal and rules. Well-designed games need no manual.

REALITY IS BROKEN

Seven kinds of work games offer?

High-stakes, busywork, mental, physical, discovery, teamwork, creative.

REALITY IS BROKEN

What is fiero?

Italian for pride: the rush after triumphing over adversity. Arms over head, yelling. 'Caveman wiring'; the harder the obstacle, the bigger the rush.

CHAPTER 12

Rules for good meetings?

Set a definite goal in advance; come prepared; leader keeps it on track; no one left out; no personal attacks; review decisions and action items; send notes.

CHAPTER 12

Fullerton's two inclusive-team exercises?

Skill sharing (sticky notes of skills to teach and learn, one teacher and one student each) and the 'Yes, and' card game.

REALITY IS BROKEN

McGonigal's four defining traits of a game?

Goal, rules, feedback system, voluntary participation. Not defining: graphics, story, rewards, competition, winning.

REALITY IS BROKEN

Why is Tetris compelling though unwinnable?

Intense visual, quantitative, and qualitative feedback keeps you at the edge of your skill (flow). An 'infinite game' played to keep playing (Carse).

REALITY IS BROKEN

'The opposite of play isn't work. It's ____.'

Depression (Brian Sutton-Smith). Gameplay is optimism about your abilities plus invigorating activity.

REALITY IS BROKEN

What did experience sampling reveal about 'relaxing fun'?

TV, chocolate, and window-shopping leave us feeling worse. Hard fun (eustress, chosen stress) leaves us measurably better.

Glossary of concepts

Every key term with its definition, why it matters, examples from the book, and what not to confuse it with.

Players

Voluntary participants who accept the rules and constraints of a game, make decisions, and are invested in the outcome.

Why it matters

Players are the reason games exist. Every design choice about how many, in what roles, and in what interaction pattern changes the whole experience. Fullerton's first job for a designer is to be the player's advocate.

Examples

- Go Fish needs 3–6 players competing; single-player Quake is one player against the system.
- Solitaire needs exactly one; tic-tac-toe exactly two; Monopoly 2–8; World of Warcraft tens of thousands.
- Mastermind won't work unless both roles (code-maker and code-breaker) are filled.

Don't confuse it with

An audience is not a player. Musicians and actors participate, but music and theater are made for people who watch. Players both partake in and consume the experience.

In this guide: Chapter 2 (Go Fish vs. Quake); Chapter 3 (invitation to play, number, roles, seven interaction patterns).

Objectives

What players are trying to accomplish within the rules; the goal that gives the game direction and sets its tone.

Why it matters

Without an objective the experience loses structure, and your desire to reach it measures your involvement. Objectives shape strategy, pacing, and even drama: capturing an enemy king feels different from spelling longer words.

Examples

- Go Fish: make the most books. Quake: stay alive and clear the level.
- Ten types: capture, chase, race, alignment, rescue/escape, forbidden act, construction, exploration, solution, outwit.
- Civilization offers a choice (conquer everyone or reach Alpha Centauri); The Sims lets you set your own.

Don't confuse it with

Objective is not outcome. Every player can achieve the objective (make books); other factors decide who actually wins.

In this guide: Chapter 2; Chapter 3 (ten objective types); Reality is Broken calls this the 'goal.'

Procedures

The actions or methods of play the rules allow: who does what, where, when, and how.

Why it matters

Procedures guide behavior into interactions that would never happen outside the game. You could search the deck for Jacks, but the procedure makes you ask one player at a time. In digital games, procedures are the controls.

Examples

- Four kinds: starting action, progression of action (including the core loop), special actions, resolving action.
- Connect Four states all four in three lines; Super Mario Bros. lists its controls and lets the system resolve the ending.
- Board game core loop: roll the dice, move your piece, do what the square says.

Don't confuse it with

Procedures are what you can do; rules are what you can't do and what happens when conditions are met. Rules can be hidden in a digital game; procedures are exposed through the controls.

In this guide: Chapter 2; Chapter 3 (who/what/where/when/how, system procedures, core loop).

Rules

Statements that define the game's objects and concepts, restrict player actions, and determine what happens when certain conditions occur.

Why it matters

Rules carry authority only because players agree to them; break them and you're no longer playing. Too many rules overwhelm players; unclear ones make them feel cheated. The less players understand the rules, the fewer meaningful choices they can make.

Examples

- Defining: a poker 'straight' exists only in poker; a chess king is an abstraction.
- Restricting: a king can't move into check; Go forbids repeating a board state; WarCraft II knights need a keep and a stable.
- Effects: run out of green mana in Jak and Daxter and you return to the checkpoint.
- Loophole-closing: 'Do not pass Go, do not collect \$200.'

Don't confuse it with

Rules vs. features (Chapter 7): rules change how the game functions; features make it richer, and every feature needs new rules.

In this guide: Chapter 2; Chapter 3 (three jobs of rules); Chapter 7 (rules before features).

Resources

Objects made valuable by their utility (they help reach the objective) and their scarcity (the designer limits them).

Why it matters

Managing resources is a core part of many games and the basis of every game economy. Both qualities are required: useful but unlimited isn't a resource, and scarce but useless is clutter.

Examples

- Sushi is a resource in Katamari Damacy (it grows your ball) but would be useless in Diablo III.
- Nine types: lives, units, health, currency, actions, power-ups, inventory, special terrain, time.
- Go Fish exchanges resources between players; Quake fixes them in place on the map.

Don't confuse it with

Not every object is a resource. The tic-tac-toe board's squares are objects; they aren't scarce and useful in the resource sense.

In this guide: Chapter 2; Chapter 3 (nine resource types); Chapter 5 (economies).

Conflict

What emerges when rules and procedures keep players from reaching the objective directly, forcing them to use skill against obstacles, opponents, or dilemmas.

Why it matters

Conflict is what players work to resolve in their favor, and it's the heart of drama too. The procedures offer inefficient means on purpose; that inefficiency is the challenge.

Examples

- Obstacles: the sack in a sack race, water on a golf course, puzzles in an adventure.
- Opponents: other players in Monopoly, enemies and players in Quake.
- Dilemmas: buy a property or upgrade one? Stay in or fold?

Don't confuse it with

Conflict is not the same as competition. Single-player games have conflict from obstacles and dilemmas with no opponent at all.

In this guide: Chapter 2; Chapter 3 (three sources); Chapter 4 (conflict as the engine of the dramatic arc).

Boundaries

What separates the game from everything that is not the game, physically (a board, a field, a level's walls in code) or conceptually (the social agreement to play).

Why it matters

Boundaries make the game feel safe and temporary: you can crush a friend's civilization and shake hands afterward. Change them and you change the game: imagine football with no sidelines or an infinite chess board.

Examples

- Go Fish's boundary is the agreement not to add or remove cards; Quake's is the 3D architecture.
- Ten people in a room where Truth or Dare is played, but two haven't agreed to play and are outside the boundary.
- ARGs like I Love Bees and 'big games' like Humans vs. Zombies deliberately open their boundaries.

Don't confuse it with

Boundaries include emotional ones, not just physical. That's what Huizinga's magic circle describes.

In this guide: Chapter 2 (magic circle); Chapter 3 (physical, conceptual, and permeable boundaries).

Outcome

The uncertain but measurable and unequal resolution of the game: a winner and losers, a score, survival or death.

Why it matters

Uncertainty keeps players playing; once the result is obvious, everyone quits (chess players concede). Players invest emotion in that uncertainty, so crafting a satisfying resolution is the designer's job.

Examples

- Go Fish: most books wins. Quake: survive or die.
- Zero-sum (chess: +1 and -1 always sum to zero) vs. non-zero-sum (WoW, cooperative Lord of the Rings, Gone Home).
- MMOs and simulations may have no end state and reward players in other ways.

Don't confuse it with

Outcome vs. objective: all players can achieve the objective; the outcome decides who wins.

In this guide: Chapter 2; Chapter 3 (zero-sum and non-zero-sum).

Challenge

Tasks that are satisfying to complete: the right amount of work to produce accomplishment, not simply 'hard.'

Why it matters

Challenge is individualized (Chutes and Ladders is hard for a kid learning to count) and dynamic (once mastered it stops being challenging), so the game must rise with the player. Too much: frustration. Too little: boredom.

Examples

- Csikszentmihalyi's flow channel: challenge and ability rising together.
- Lazzaro's Hard Fun: get the player almost ready to quit, then let them succeed (fiero).
- Tetris gets harder only when you're playing well.

Don't confuse it with

Difficulty is not challenge. Adding enemy health extends time without adding meaningful challenge; new strategies do.

In this guide: Chapter 2; Chapter 4 (flow); Chapter 9 (Lazzaro).

Play

'Free movement within a more rigid structure' (Salen and Zimmerman), like the play in a steering wheel: the freedom players have inside the rules for imagination, expression, and experimentation.

Why it matters

Rigid rules paradoxically create room to play. Designing for the kind of play your audience wants, and leaving space for free play, keeps them engaged. Play is a state of mind that can be applied to serious subjects.

Examples

- Caillois: agôn (competition), alea (chance), mimicry (make-believe),ilinx (vertigo); ludus (rule-bound) vs. paidia (free-form).
- Ten player types: competitor, explorer, collector, achiever, joker, artist, director, storyteller, performer, craftsman.
- Levels of engagement: spectator, participant, transformational.

Don't confuse it with

Play is not a game. To engage with a game is to play it, but play exists outside games too.

In this guide: Chapter 2; Chapter 4 (nature of play, types of players).

Premise

The setting or metaphor that establishes the game's action and gives context to the formal elements.

Why it matters

Its first job is to make the system playable: shoot aliens, not blocks. Its second is emotional appeal. Space Invaders needs only a thin premise; Myst's untrustworthy brothers make every clue matter.

Examples

- Monopoly: be a land-grabbing landlord (appealing in the Depression).
- Exposition supplies time, place, characters, status quo, the problem, and the point of attack.
- Pitfall Harry hunts diamond rings instead of 'a resource worth 5000 points.'

Don't confuse it with

Premise vs. story: a premise doesn't have to go anywhere; a story unfolds as the game progresses.

In this guide: Chapter 2; Chapter 4.

Character

The agents through whom drama is told, and in games also the vessel for the player's own participation: 'a mask we create and direct.'

Why it matters

Game characters balance agency (representing the player) with empathy (emotional attachment). Neither authored heroes nor player-made avatars are better; pick what fits your experience goals.

Examples

- Round vs. flat: Hamlet vs. the lazy guard. Mario in Donkey Kong was flat and static.
- Four questions: what does the character want? need? What does the player hope? fear?
- Free will vs. control: Sonic's foot-tapping, The Sims' autonomous needs, Halo's fleeing enemies, Façade.

Don't confuse it with

Agency is the character's function as your representation; empathy is your attachment to them. Both must be considered at every level.

In this guide: Chapter 2; Chapter 4.

Story

Narrative that unfolds with the game. Hard to integrate because a story's uncertainty is resolved by the author while a game's is resolved by the players.

Why it matters

Story integrated with play can create powerful emotion, but pasted-on story disconnects from gameplay. Designers keep experimenting with how deep it can go without sacrificing play.

Examples

- Backstory: WarCraft's chapters between levels (replay until you earn the next beat, like Groundhog Day).
- Branching: Heavy Rain's wildly different endings; usually limited in scope.
- Emergent: The Sims' scrapbooks. Linear but integrated: The Last of Us. Choice-driven: The Walking Dead.

Don't confuse it with

Story vs. premise: premise is context; story has narrative movement. Also see world building, the natural fit between story and games.

In this guide: Chapter 2; Chapter 4 (story, world building, the dramatic arc).

Dramatic arc

The rise and fall of tension over time: exposition, conflict, rising action, climax, falling action, resolution.

Why it matters

Games usually rise in challenge anyway; a well-integrated game makes the story develop as the challenge rises. And unlike film, the player resolves the climax, adding personal accomplishment to empathy.

Examples

- Jaws: Brody's fear of water, escalating attacks, the final hunt.
- Donkey Kong: each level harder, Pauline carried higher, remove the rivets to topple Kong. Critique: Mario has no inner conflict and Pauline's jeopardy never grows.
- Journey: Chen mapped emotional intensity per level to the Hero's Journey and doubled the climactic leap after playtests.

Don't confuse it with

The arc is about tension, not plot events. Even abstract games can have one.

In this guide: Chapter 4.

Formal elements

The eight structural elements every game shares: players, objectives, procedures, rules, resources, conflict, boundaries, outcome. Without them, a game stops being a game.

Why it matters

They give beginners structure for design choices and a vocabulary for diagnosing playtest problems. Master them so you can experiment with alternatives.

Examples

- Remove Gin Rummy's discard procedure, then drawing, then the objective (Exercise 3.1): each removal breaks the game.
- Exercise 2.9 asks you to identify all eight in Sprouts.
- Change one (add a third player to tic-tac-toe) and the others must change too.

Don't confuse it with

Formal elements give structure; dramatic elements give meaning. A sword's damage value is formal; that it belonged to the hero's parent is dramatic.

In this guide: Chapter 2 (introduced); Chapter 3 (each one in depth).

Dramatic elements

The elements that engage players emotionally by giving context to the formal system: challenge and play (in every game), plus premise, character, story, and the dramatic arc.

Why it matters

Formal elements make it a game; dramatic elements make you care. The best games align rising gameplay tension with rising dramatic tension.

Examples

- Checkers is abstract; Exercise 4.1 asks you to add dramatic elements and see what changes.
- 'You are a set of data' vs. 'you are Gregor the dwarf attacking a wizard': same system, different feeling.
- Donkey Kong ties each harder level to Pauline being carried higher.

Don't confuse it with

Story is not required. Challenge and play are dramatic elements present even in abstract games like Tetris.

In this guide: Chapter 2 (introduced); Chapter 4 (each one in depth).

Playcentric approach

Fullerton's method: keep the player experience at the center by setting experience goals, prototyping early, and playtesting with target players through every phase.

Why it matters

It's the whole book in one word, and the antidote to the industry habit of designing during production when changes are expensive.

Examples

- Physical prototype before a single programmer or artist joins.
- 'You can't be the advocate for the player if you don't know what the player is thinking.'

Don't confuse it with

Not the same as 'player-friendly.' It's a process discipline, not a difficulty setting.

In this guide: Introduction; Chapter 1; everywhere after.

Flow

Csikszentmihalyi's state of optimal experience, when challenge and ability rise together and you're balanced between frustration and boredom.

Why it matters

That balance is exactly what gameplay tries to achieve. The eight elements of flow are a checklist for design questions about goals, feedback, control, and distraction.

Examples

- A challenging activity requiring skill; merging of action and awareness; clear goals and feedback; concentration; the paradox of control; loss of self-consciousness; transformed time; autotelic experience.
- McGonigal: Tetris keeps you 'on the very edge of your skill level.'

Don't confuse it with

The paradox of control: you can only feel in control when the outcome is uncertain and you can influence it. Guaranteed success isn't flow.

In this guide: Chapter 4; Chapter 6 (Csikszentmihalyi on creativity); Reality is Broken.

Magic circle

Huizinga's term for the temporary world where the rules of the game apply instead of the rules of ordinary life.

Why it matters

It explains boundaries and emotional safety: inside, you can betray your best friend; outside, no consequences. Designing the invitation into the circle and the exit from it is part of designing the game.

Examples

- 'The arena, the card-table, the magic circle, the temple, the stage, the screen, the court of justice.'
- Romero's daughter felt the Middle Passage through 'time in the magic circle.'
- Guitar Hero's controller is an invitation into the fantasy, not just the game.

Don't confuse it with

Not a literal circle. Go Fish's magic circle is a social agreement with no physical edge at all.

In this guide: Chapter 2; Chapter 3 (boundaries, invitation to play).

Lusory attitude

Bernard Suits's term for voluntarily adopting rules that require worse rather than better means to reach an end. From the Latin for 'game.'

Why it matters

It's the psychological state you design for. Players accept golf's absurd constraints because they've chosen to; McGonigal builds her whole definition ('the voluntary attempt to overcome unnecessary obstacles') on it.

Examples

- You could drop the golf ball in the hole by hand; you hit it with a stick from 400 yards instead.
- Scrabble turns 'typing' into a game with seven random tiles and a limited supply.

Don't confuse it with

Not the same as being competitive. The attitude is acceptance of constraints, whether or not anyone wins.

In this guide: Chapter 2; Reality is Broken ('voluntary participation').

Player experience goals

Descriptions of the interesting situations or feelings you want players to have, set before any features are designed.

Why it matters

They keep you focused on what players think and feel rather than on features, and they're what every prototype gets playtested against. Beginners' hardest task is seeing past features to the experience.

Examples

- 'Players will have to cooperate to win but can never trust each other.'
- 'Players will feel playful rather than competitive.'
- Before modifying Up the River, set a goal like 'resolved by strategy, not chance.'

Don't confuse it with

A feature says what the game contains (a crafting system); an experience goal says what the player feels or faces.

In this guide: Chapter 1; Chapter 6 (brainstorm challenges); Chapter 7 (controlled design exercises).

Iteration

Designing, testing, and evaluating over and over, improving each time, until the player experience meets your goals.

Why it matters

Games are second-order designs: you can't script play in advance, only test it. Iteration applies from the first concept to final QA, with changes getting smaller as production proceeds.

Examples

- The loop: set goals → conceive → formalize → test → evaluate; fundamentally flawed means start over.
- Seven steps: brainstorming, physical prototype, presentation, software prototypes, documentation, production, QA.
- SiSSYFiGHT 2000: Post-its → IRC text → web build → beta community.

Don't confuse it with

Iteration isn't polishing. Early iterations should be fast, cheap, public, and physical.

In this guide: Chapter 1; Chapter 7; Chapter 9 (the cycle tightens over production).

Core loop / core mechanic

The set of procedures that repeat throughout play to move the game forward; the actions a player repeats most often while pursuing the goal.

Why it matters

Games are repetitive by nature. Isolate the core mechanic first, diagram it, and build out; if the core isn't fun, nothing layered on top will save it.

Examples

- Board game: roll, move, do what the square says.
- Monopoly: buy and improve properties to charge rent. Bomberman: move through a maze dropping bombs.
- Dan Cook's interaction loop: mental model → decision → action → rules → feedback → updated model.

Don't confuse it with

Core loop (procedures) vs. feedback loop (system dynamics). Different uses of 'loop.'

In this guide: Chapter 3 (procedures); Chapter 5 (Cook's sidebar); Chapter 7 (visualizing core gameplay).

Player interaction patterns

Seven structures for how players relate to the system and each other, adapted from E. M. Avedon.

Why it matters

Most digital games use only two patterns (single player vs. game, multilateral competition). The others, especially unilateral competition and cooperative play, are underexplored territory.

Examples

- 1 single player vs. game (Pac-Man); 2 multiple individuals vs. game (bingo, FarmVille); 3 player vs. player (chess); 4 unilateral competition (tag, Scotland Yard); 5 multilateral competition (poker, Call of Duty); 6 cooperative play (Journey, Portal 2); 7 team competition (soccer, Team Fortress 2).

Don't confuse it with

Interaction pattern is about structure, not player count. Bingo with fifty people is still 'individuals vs. game.'

In this guide: Chapter 3.

System (objects, properties, behaviors, relationships)

A set of interacting elements forming a whole with a common purpose. Game systems are built from objects with properties and behaviors, linked by relationships.

Why it matters

Change any element and the whole system shifts, sometimes catastrophically. A system can only be understood in motion, which is why playtesting is unavoidable.

Examples

- A checker: three properties (color, location, type) and two behaviors. A Diablo character: dozens of each.
- Remove relationships and you have a collection (blank index cards), not a system.
- WarCraft II's damage formula mixes rules and chance to define unit relationships.

Don't confuse it with

'Greater than the sum of its parts' means you can't predict play by studying elements separately.

In this guide: Chapter 2 (the sum of the parts); Chapter 5.

Emergence

Complex, unpredictable behavior arising from simple rules interacting within a system.

Why it matters

You don't need a complex design to get complex play. Emergent techniques make AI and worlds more believable and replayable.

Examples

- Conway's Game of Life: three rules produce gliders.
- Halo's enemies run on perception, memory, and emotion and flee when outnumbered.
- The Sims: rules in characters interact with rules in objects (a sleepy Sim and a bed).

Don't confuse it with

Emergent story (The Sims) is one application of emergence; it's not the same as branching story.

In this guide: Chapter 5; Chapter 4 (emergent story).

Feedback loops (reinforcing and balancing)

In systems terms, feedback is when the output of an interaction directly changes another element. Reinforcing (positive) loops push further in the same direction; balancing (negative) loops push toward equilibrium.

Why it matters

Reinforcing loops create risk/reward and drive toward an unequal outcome; balancing loops keep games from resolving too fast. Tuning is knowing which is running and when to add the other.

Examples

- Reinforcing: score a point, get a free turn; Jeopardy! board control.
- Balancing: score in football and the other team gets the ball; Catan's seven-roll discard.

Don't confuse it with

'Positive' and 'negative' aren't good and bad. A positive loop can ruin balance; a negative loop can make a game feel pointless.

In this guide: Chapter 5; Chapter 7 (diagramming spots them early).

Information structures

How much players know about the game state: open, hidden, mixed, or dynamic.

Why it matters

Less information means less informed choices, more chance, and room for bluffing and deception. It changes which kind of player your game appeals to.

Examples

- Open: chess, Go (calculation). Hidden: 5-card stud face down (social reading).
- Mixed: 7-card stud, blackjack. Dynamic: WarCraft's fog of war.

Don't confuse it with

Hidden information isn't randomness. Poker's cards are fixed once dealt; you just don't know them.

In this guide: Chapter 5; Exercises 5.6–5.7.

Game economy

A system of exchange of resources with the system or between players, requiring items, agents, and methods of exchange; currency is optional.

Why it matters

Economies turn rudimentary games into complex systems and make socializing into a game. Every economic action should advance or hinder the player's objective.

Examples

- Pit (simple barter), Catan (complex barter with a 4:1 cap), Monopoly (simple market), Ultima Online (persistent complex market), Magic (metaeconomy), Clash of Clans (free-to-play).

Don't confuse it with

A metaeconomy exists outside the game (eBay characters, card markets). Free-to-play designs bring it inside.

In this guide: Chapter 3 (currency); Chapter 5.

Second-order design

Salen and Zimmerman's point that designers create rules, but players experience play, which emerges only when rules are inhabited.

Why it matters

It's why you can't script the experience and must prototype and playtest. You craft a 'possibility space,' not an experience.

Examples

- SiSSYFiGHT's turn results felt arbitrary until many revisions with testers.
- Fullerton: 'we cannot determine exactly how the rules will play out.'

Don't confuse it with

It doesn't mean designers have no control, only that control is indirect.

In this guide: Chapter 1 (Zimmerman's sidebar); Chapter 5.

The 'X' (razor and slogan)

EA's term for a game's creative center, which also aligns team, marketing, and customers. The razor cuts (decides which features belong); the slogan sells.

Why it matters

After narrowing to three ideas, defining each X keeps second-level brainstorming and production focused.

Examples

- Medal of Honor razor: 'GoldenEye set in WWII on a PlayStation.' Slogan: 'Prepare for your finest hour.'

Don't confuse it with

A slogan alone won't guide design decisions; a razor alone won't sell.

In this guide: Chapter 6; Exercise 6.7.

Prototype

A working model of an idea that tests its feasibility so you can improve it: playable but rough, a sketch focused on a few mechanics.

Why it matters

Nothing improves gameplay more. Physical prototypes keep you on mechanics, iterate in minutes, and let everyone contribute. Prototypes are disposable: 'sketches, not blueprints.'

Examples

- Battleship on four sheets of graph paper; an FPS on hex paper with matchstick walls.
- Four steps: foundation, structure, formal details, refinement.
- Gingold: two days to two weeks, with a hypothesis.

Don't confuse it with

A prototype is not an early version of the final game. Never try to ship one.

In this guide: Chapter 1; Chapter 3 (LeTourneau); Chapter 6; Chapter 7.

Playtesting

What the designer does throughout the process to gain insight into how players experience the game.

Why it matters

The single most important activity a designer does. Test from day one; by beta it's too late to change fundamentals.

Examples

- Script: intro, warm-up, 15–20 minute play (think aloud), discussion, wrap-up.
- Recruit: self, confidants, strangers, target audience.
- Tools: play matrix, notes form, control situations, metrics.

Don't confuse it with

Not an internal design review, QA, a focus group, or usability testing.

In this guide: Chapter 1; Chapter 9.

Play matrix

Fullerton's two-axis tool: skill ↔ chance horizontally, mental calculation ↔ physical dexterity vertically.

Why it matters

It gives testers a vocabulary to say where your game sits and where they'd rather it be, and suggests concrete changes (replace dice with chosen cards to move toward skill).

Examples

- Chess: top left. Blackjack: top, right of center.
- Video games cluster physical + skill; board games mental + skill; gambling mental + chance; kids' games physical + chance.

Don't confuse it with

It's a discussion tool, not a measurement; people will plot the same game differently.

In this guide: Chapter 9.

Fiero

Italian for pride: the rush of personal triumph over adversity. Arms over the head, yelling.

Why it matters

The key emotion of Lazzaro's Hard Fun and, for McGonigal, possibly the most primal rush we can feel. It requires frustration first, so difficulty must rise with skill.

Examples

- Get players almost ready to quit, then let them succeed.
- Neuroscientists call it 'caveman wiring'; it lights three reward structures.

Don't confuse it with

Fiero isn't fun in general; Easy Fun brings curiosity, People Fun brings amusement.

In this guide: Chapter 9 (Lazzaro); Reality is Broken.

Procedurality / persuasive games

Bogost's idea that video games represent a source system by modeling its behavior in code, and because every model is subjective, games can make arguments.

Why it matters

Mechanics aren't neutral. What a model includes and leaves out expresses a point of view, and players learn it by acting inside the system.

Examples

- Airport Insecurity models TSA lines from public data.
- Cruel 2 B Kind: Assassin played with kindness on city streets.
- Romero's Train: the meaning arises from what the player does with the rules.

Don't confuse it with

Procedurality (representation through rules) vs. procedures (the formal element of allowed actions).

In this guide: Chapter 3 (Bogost's sidebar, Romero's sidebar).

Zero-sum vs. non-zero-sum

Zero-sum: one player's win (+1) equals another's loss (−1), so outcomes sum to zero. Non-zero-sum: gains and losses don't cancel.

Why it matters

Non-zero-sum games allow subtler rewards (rankings, stats, multiple or player-made objectives) and interesting interdependent risk/reward dilemmas.

Examples

- Zero-sum: chess, tennis. Non-zero-sum: World of Warcraft, cooperative Lord of the Rings, Gone Home.

Don't confuse it with

Non-zero-sum doesn't mean nobody wins; it means winning isn't paid for entirely by someone else's loss.

In this guide: Chapter 3 (outcome).

McGonigal's four traits

Every game has a goal, rules, a feedback system, and voluntary participation. Everything else (story, graphics, rewards, competition, winning) reinforces those four.

Why it matters

A compact definition that maps onto Fullerton's: goal = objective, rules = rules and procedures, feedback = outcome and system feedback, voluntary participation = the lusory attitude and magic circle.

Examples

- Golf, Scrabble, Tetris (unwinnable), and Portal (learn the feedback first) all pass the test.

Don't confuse it with

Winning is not a defining trait. Tetris is an 'infinite game' played to keep playing.

In this guide: Reality is Broken.

Game Analyzer

Print extra copies of this page and fill one in for each game you analyze.

Game

e.g. Sprouts, Catan, Balatro

Players

How many? Roles? Which of the 7 interaction patterns?

Objective

What are players trying to do? Which type (capture, race, alignment...)?

Procedures

Starting action, core loop, special actions, resolving action

Rules

Object definitions, restrictions, if-then effects

Resources

What's useful AND scarce?

Conflict

Obstacles, opponents, dilemmas?

Boundaries

Physical or conceptual?

Outcome

How is it decided? Zero-sum or non-zero-sum?

Challenge & play

What's hard? Does challenge rise with skill?
Where's the free play inside the rules?

Premise, character, story

What context makes you care? Round or flat characters? Does the story branch or emerge?

What player experience goal do you think the designer set?

Write it as an experience, not a feature

People to know

Every designer, theorist, and interviewee mentioned in the guide, alphabetical by last name.

PLAY SCHOLAR · THE STUDY OF GAMES (1971)

E. M. Avedon

'The Structural Elements of Games' · The Study of Games (with Brian Sutton-Smith)

Elliott Avedon co-edited The Study of Games with Brian Sutton-Smith, an early scholarly anthology on games. His article on structural elements is the source Fullerton adapts for the seven player interaction patterns, from single player vs. game to team competition.

In this guide: Chapter 3 (player interaction patterns).

CO-CREATOR OF CENTIPEDE

Dona Bailey

Centipede (1981, with Ed Logg)

When Bailey joined Atari's coin-op division in 1981 she was the only woman employed there. Handed a notebook of possible game ideas, all of which involved 'lasering or frying things,' she chose a short description of a bug winding down the screen because 'it didn't seem bad to shoot a bug.' Centipede became one of the most commercially successful games of the arcade era's golden age.

In this guide: Chapter 1 (Designers You Should Know).

CO-CREATOR OF THE FIRST MUD

Richard Bartle

MUD (1978, with Roy Trubshaw) · 'Hearts, Clubs, Diamonds, Spades: Players Who Suit MUDs' (1996) · Designing Virtual Worlds

Bartle co-wrote the first multiuser dungeon at Essex University in 1978, the ancestor of every online world. His widely referenced 1996 article sorted the players he observed into four types: achievers (act on the world), explorers (interact with the world), socializers (interact with players), and killers (act on players). He found players have a primary style and switch only when it suits them. Fullerton uses the types as roles to consider when balancing a design.

In this guide: Chapter 3 (roles of players); Chapter 4 (compared with Fullerton's ten player types).

HARVARD POSITIVE PSYCHOLOGY LECTURER

Tal Ben-Shahar

Happier (2007) · Harvard's popular positive psychology course

Ben-Shahar taught one of Harvard's most popular courses, on positive psychology. McGonigal quotes his line, 'We're much happier enlivening time rather than killing time,' to sum up the experience-sampling finding that chosen hard work beats passive relaxation.

In this guide: Reality is Broken.

GEORGIA TECH PROFESSOR · PERSUASIVE GAMES

Ian Bogost

Persuasive Games: The Expressive Power of Videogames · Airport Insecurity · Cruel 2 B Kind (with Jane McGonigal) · Cow Clicker

Bogost holds the Ivan Allen College Distinguished Chair in Media Studies at Georgia Tech and cofounded the studio Persuasive Games. His sidebar explains 'procedurality': video games represent a source system (football, a city, airport security) by modeling its behavior in code, and because every model is subjective, games can make arguments. Airport Insecurity models TSA lines from public data and lets you decide whether to sneak a knife through. Persuasive games work, he says, by being 'disruptive and strange' rather than seamless.

In this guide: Chapter 3 ('Persuasive Games' sidebar).

Roger Caillois

Agôn, alea, mimicry, ilinx · Ludus vs. paidia

Building on Huizinga, Caillois classified play into four fundamental types: agôn (competition), alea (chance), mimicry (make-believe), and ilinx (vertigo), and crossed them with ludus (rule-bound) and paidia (free-form, improvisational). The scheme lets designers name the specific pleasure a game offers, which helps when writing player experience goals. Strategy games are competitive ludus; role-playing mixes mimicry and competition in rules.

In this guide: Chapter 4 (types of play).

Joseph Campbell

The monomyth / Hero's Journey

Campbell identified a pattern shared by heroic stories across cultures: a call to action, crossing the first threshold out of the normal world, trials and temptation, the abyss with a form of death and rebirth, and a transformed return. Jenova Chen designed Journey's emotional arc to follow it in spirit, expressing each phase through color, architecture, sound, and shifts in mechanics.

In this guide: Chapter 4 (Journey's dramatic arc).

James P. Carse

Finite and Infinite Games

Carse distinguished finite games, played to win and end, from infinite games, played to keep playing as long as possible. McGonigal uses the distinction to explain Tetris: an unwinnable game that millions play for the sole purpose of continuing to play. Many gamers, she notes, would rather keep playing than win.

In this guide: Reality is Broken.

Jenova Chen

[Journey \(2012\)](#) · [Flower \(2009\)](#) · [fIOW \(2007\)](#) · [Cloud \(2005, USC student game\)](#) · [Sky: Children of the Light](#)

Chen came from Shanghai to USC's interactive media program in 2003, where student games Cloud and fIOW led to a Sony deal and a company founded with classmates. Cloud began as 'can we make a game about beautiful clouds?' and became the peaceful feeling of daydreaming; he learned that 'challenging' and 'relaxing' are contradictory goals and kept asking what emotion the game should evoke. For Journey he mapped emotional intensity per level against Campbell's Hero's Journey and, after playtesting, doubled the leap from the abyss to revelation. Journey's players communicate with a single sung note and still form deep bonds. He believes there is no natural-born talent, only passion and accumulated hours.

In this guide: Chapter 3 (cooperative play); Chapter 4 (Journey's arc); Chapter 6 (experimental games); Chapter 9 (Flower playtest); Chapter 12 (Designer Perspective).

MATHEMATICIAN · THE GAME OF LIFE

John Conway

[Game of Life \(1970\)](#) · [Sprouts \(1967, with Mike Paterson\)](#) · [Surreal numbers](#)

A Cambridge mathematician fascinated by how simple rules produce complexity, Conway spent years designing, testing, and revising rules for cells on a checkerboard, exactly like a game designer. His final three rules (birth at three neighbors, death below two or at four or more) produced patterns that grow, fizzle, or, as his colleague Richard Guy discovered with the glider, walk across the board. He also co-invented Sprouts, the pen-and-paper game in Fullerton's Exercise 2.9.

In this guide: Chapter 2 (Sprouts exercise); Chapter 5 (emergent systems).

Daniel Cook

[Triple Town](#) · [Alphabear](#) · [Realm of the Mad God](#) · [Tyrian](#) · [Lostgarden.com essays](#)

Cook writes some of the most-read essays on game design theory at Lostgarden. His sidebar defines the interaction loop (mental model, decision, action, rules, feedback, updated model) and skill chains, where lower-order loops like jump and move must be mastered before compound skills like killing a Goomba. Arcs deliver authored content once; loops build 'wisdom' through repetition. His analysis question for any game: 'What repeats and what does not?'

In this guide: Chapter 3 (core loop reference); Chapter 5 ('Interaction Loops and Arcs' sidebar); Chapter 7 (core mechanics).

VETERAN DESIGNER AND THEORIST

Chris Crawford

[Chris Crawford on Game Design](#) · [Balance of Power](#), [Eastern Front](#) · [Founded the Game Developers Conference](#)

One of the industry's first design theorists, Crawford wrote *The Art of Computer Game Design* in 1982 and founded the gathering that became GDC. Scott Kim borrows his four types of play activities, from most to least interactive: games (winning), puzzles (a goal), toys (no goal), stories (no interaction). Chaim Gingold credits Crawford's writing on failure-as-prototype with changing his attitude toward his own unfinished projects.

In this guide: Chapter 2 (Kim's sidebar); Chapter 7 (Gingold's sidebar).

Mihaly Csikszentmihalyi

Flow: The Psychology of Optimal Experience (1990) • Creativity: Flow and the Psychology of Discovery and Invention (1996)

Csikszentmihalyi (pronounced roughly 'chick-sent-me-high') studied musicians, rock climbers, painters, and game players and found they all described enjoyment the same way. He named the state 'flow': a challenging activity requiring skill, merging of action and awareness, clear goals and feedback, concentration, the paradox of control, loss of self-consciousness, transformed time, and an activity that becomes an end in itself (autotelic). Flow lives in the channel between frustration and boredom as challenge rises with ability. His later work on creativity gives Chapter 6 its five stages: preparation, incubation, insight, evaluation, elaboration.

In this guide: Chapter 4 (challenge and flow); Chapter 6 (stages of creativity).

Don Daglow

Baseball (1971, first interactive sports game) • Dungeon (1975, first computer RPG) • Utopia (1982, first god game) • Earl Weaver Baseball, Tony La Russa Baseball • Neverwinter Nights on AOL (first graphical MMORPG)

Daglow wrote games on university mainframes through the 1970s, then answered an Intellivision radio ad and joined Mattel's original five-person design team. He founded Stormfront Studios in 1988 and won a Technical Emmy for Neverwinter Nights on AOL. His list of design-changing games: Seven Cities of Gold, Super Mario Bros., SimCity (broke every commandment), Madden on Genesis, GTA III, Minecraft. Advice: 'Enjoy the journey, not just the wrap party.' Chasing celebrity is the fastest way to sabotage a career.

In this guide: Chapter 4 (Designer Perspective).

Ian Dallas

[What Remains of Edith Finch \(2017\)](#) · [The Unfinished Swan \(2012\)](#)

Dallas makes games that help people see the world in new ways. Edith Finch began with a target emotion, the sublime, from a memory of scuba diving at 14 and watching the seafloor slope into darkness. A literal scuba simulator felt flat, so the team hunted for the feeling elsewhere and found it in the short stories of 1930s *Weird Fiction*, reshaping the game into a collection of stories. His director's questions: 'Where are we going?' and 'What's most broken?' He runs short, frequent playtests because frustrating controls knock players out of a delicate mood.

In this guide: Chapter 4 ('Directing Games for Emotion' sidebar).

PLAY THEORIST · THE WELL-PLAYED GAME

Bernie DeKoven

[The Well-Played Game: A Playful Path to Wholeness](#) · [New Games movement](#)

DeKoven, a designer and philosopher of play, argued that players should be willing to alter the rules to keep a game fun for everyone: an expert playing a beginner at chess can start with fewer pieces or allow take-backs. Scott Kim cites him, and your course's last class is titled 'The Well-Played Game' after his book.

In this guide: Chapter 2 (Kim's sidebar and Further Reading); course schedule, 12/9.

FORMER CHIEF VISUAL AND TECHNICAL OFFICER, ELECTRONIC ARTS

Glenn Entis

[EA Preproduction Workshop](#) · [Pacific Data Images \(cofounder\)](#) · [DreamWorks Interactive \(CEO\)](#)

Entis cofounded the pioneering animation studio Pacific Data Images and ran DreamWorks Interactive before leading EA's worldwide community of 3,000 artists and engineers. In 2004 he took the EA Preproduction Workshop to all 12 studios, personally leading it 14 times: two days of 15–20 minute hands-on exercises with real projects, no lectures. His prototyping mantra is 'fast, cheap, public, and physical.' He also coined the two halves of a game's 'X': the razor that cuts features and the slogan that sells.

In this guide: Chapter 1 (industry prototyping); Chapter 6 (EA workshop sidebar, the X).

James Ernest

Kill Doctor Lucky · Lords of Vegas · Button Men, Diceland · Give Me the Brain, Brawl

Ernest worked with Wizards of the Coast around Magic's release, then started Cheapass Games in 1996 with a backlog of unpublished designs. He loves simple games with deep strategy, poker above all. Unlike designers who invent mechanics first, he settles the theme first, because a good theme suggests mechanics you'd never consider. He paper-prototypes everything, even computer games. Advice: 'become addicted to simplicity,' don't copy numbers from other games, and 'Write the game you want to play.'

In this guide: Chapter 7 (Designer Perspective).

INVENTOR OF SET

Marsha Falco

Set (1988) · Set Enterprises (family business)

Falco was a population geneticist in Cambridge, England, studying whether epilepsy in German shepherds is inherited. She wrote gene combinations on file cards with symbols to represent blocks of data, and one day found her kids playing with them. The game was so fun the family published it. Set won a Mensa award and remains a classic example of elegant system design: 81 cards, four properties, three options each.

In this guide: Chapter 5 ('Deconstructing Set' sidebar).

PRESIDENT, ZENIMAX ONLINE STUDIOS

Matt Firor

Dark Age of Camelot (2001) · The Elder Scrolls Online (2014) · Tempest (1992 dial-up RPG)

Firor and friends spent four years of nights and weekends building Tempest, a 16-player dial-up RPG, as a hobby before merging into Mythic Entertainment in 1996. He designed and produced online games there for over a decade before directing The Elder Scrolls Online. MMOs, he says, require creating a world as well as a game, and sticking to strict rules for its direction. Balancing Dark Age of Camelot's player-versus-player combat was 'extremely thorny.' Advice: get in the door however you can, then be patient.

In this guide: Chapter 12 (Designer Perspective).

AUTHOR OF GAME DESIGN WORKSHOP · USC GAMES

Tracy Fullerton

The Night Journey (with Bill Viola) · Walden, a game · Cloud (faculty advisor) · USC Interactive Media & Games program

Fullerton designed games for Microsoft, Sony, MTV, and Disney before spending more than 20 years building the game design curriculum at the USC School of Cinematic Arts, where she directs the Game Innovation Lab. Her students founded thatgamecompany (flOw, Flower, Journey) and have worked on League of Legends, Bioshock 2, and What Remains of Edith Finch. Her own game about Henry David Thoreau's experiment at Walden Pond took ten years to make. The 'playcentric' approach in this book is her method: set player experience goals, prototype on paper, playtest early, iterate.

In this guide: Every chapter. Her sidebar on inclusive teams is in Chapter 12.

Bill Fulton

Microsoft Games User Research Group (cofounder) · Age of Empires 2 tutorial testing · Halo, Project Gotham Racing, Forza research

Fulton cofounded the Games User Research Group at Microsoft (1997–2004), then moved into game design on Shadowrun and later UX at Amazon. His sidebar argues most games disappoint because developers know so much more about games than typical players that what's fun for them isn't yet fun for the audience. The Age of Empires 2 tutorial test with an elderly grandmother who understood the game without enjoying it shows what testing with real people can achieve.

In this guide: Chapter 9 ('How Feedback from Typical Gamers...' sidebar).

CREATOR OF MAGIC: THE GATHERING

Richard Garfield

Magic: The Gathering (1993) · RoboRally · Netrunner · King of Tokyo, KeyForge

In 1990 Garfield was a mathematics graduate student at Penn trying to sell a board game called RoboRally. Wizards of the Coast couldn't publish it but asked for a portable card game playable in under an hour. Drawing on Cosmic Encounter's endless variety, childhood marbles trading, and Strat-O-Matic Baseball drafting, he built a dueling game where each card changes the rules and the deck is infinitely expandable. Magic singlehandedly spawned the collectible card game industry, and when Hasbro bought Wizards in 1995 for \$325 million, Garfield owned a significant share. His two-part sidebar traces the game's playtesting, its 'rich kid syndrome' worry, degenerate decks, and the Pro Tour.

In this guide: Chapter 1 (Designers You Should Know); Chapter 5 (Magic's metaeconomy); Chapter 7 (Design Evolution of Magic sidebar).

Richard Garriott

[Akalabeth \(1979\)](#) · [Ultima series](#) · [Ultima Online \(1997\)](#) · [Tabula Rasa](#)

Garriott programmed his first game, the RPG Akalabeth, right out of high school in 1979 and sold it through a local Austin computer store in a Ziploc bag. It was picked up by a publisher and led to Ultima, one of the most famous game series of all time, each entry pushing technology and gameplay. Ultima IV, which gave players moral choices with consequences, was Warren Spector's masterpiece touchstone. Ultima Online in 1997 pioneered massively multiplayer online worlds and, as Chapter 5 recounts, had to abandon a self-regulating economy when players hoarded everything.

In this guide: Chapter 1 (Designers You Should Know); Chapter 5 (Ultima Online's economy).

Chaim Gingold

[Spore Creature Creator](#) · [Earth: A Primer](#) · [Building SimCity \(2024 book\)](#)

Gingold looked back on 12 years of unfinished programs and saw failures until Chris Crawford and Ken Perlin taught him to see them as prototypes, sketches, and studies. An internship with Will Wright on Spore, working at a folding table under an old Mac full of Maxis prototypes, showed him The Sims had been built from isolated experiments. His rules: always ask a question, stay falsifiable, persuade and inspire, work fast (two days to two weeks), work economically, decompose problems. Good prototypers are 'powerful ninjas' who cut design debates to shreds.

In this guide: Chapter 7 ('Catastrophic Prototyping and Other Stories' sidebar).

CO-CREATOR OF DUNGEONS & DRAGONS

Gary Gygax

[Chainmail](#) · [Dungeons & Dragons \(1974, with Dave Arneson\)](#) · [TSR](#)

In the early 1970s Gygax was an insurance underwriter in Lake Geneva, Wisconsin, who loved tabletop war games where players commanded armies of miniatures. He and his friends had fun acting out the personas of commanders and heroes, so he created Chainmail for battling small parties, and players wanted still more control over individual characters. With Dave Arneson he developed the elaborate role-playing system that became Dungeons & Dragons, the direct ancestor of every paper and digital RPG since, from Diablo and Baldur's Gate to World of Warcraft.

In this guide: Chapter 1 (Designers You Should Know); Chapter 7 (paper systems behind digital RPGs).

WRITER AND CREATIVE DIRECTOR

Amy Hennig

[Uncharted series \(Naughty Dog\)](#) · [Legacy of Kain: Soul Reaver](#) · [Michael Jordan: Chaos in the Windy City](#)

Hennig started as an artist and animator on NES games. While working at Electronic Arts on Michael Jordan: Chaos in the Windy City, the lead designer left and she landed the job. At Crystal Dynamics she directed, produced, and wrote Legacy of Kain: Soul Reaver, then became the creative force behind the Uncharted series at Naughty Dog, winning two Writers Guild of America Video Game Writing Awards. She describes her work as being on the 'bleeding edge' of cinematic video games.

In this guide: Chapter 1 (Designers You Should Know).

CEO AND COFOUNDER, MIDWINTER ENTERTAINMENT

Josh Holmes

NBA Street (2001) · Def Jam Vendetta, Def Jam: Fight for NY · Turok (2008) · Halo: Reach, Halo 4 (343 Industries)

Holmes remixed his family's board games as a kid, ran paper RPG campaigns, and broke in as an EA tester before leading the surprise hit NBA Street. As Halo franchise creative director at 343 Industries he shipped Halo 4 with a brand-new studio while everyone predicted failure. His process: a vision statement, a few pillars, fast prototypes before greenlighting, and constant 'Kleenex testing' with fresh players in production. Advice: 'Start designing and building games. Today!'

In this guide: Chapter 6 (Designer Perspective).

DUTCH HISTORIAN · HOMO LUDENS (1938)

Johan Huizinga

Homo Ludens: A Study of the Play Element in Culture · The 'magic circle'

Huizinga, a cultural historian, argued that play is older than culture and that civilization arises in and as play. His book gives game design its most-cited metaphor, the magic circle: 'the arena, the card-table, the magic circle, the temple, the stage, the screen, the court of justice' are all playgrounds, 'temporary worlds within the ordinary world, dedicated to the performance of an act apart.' Fullerton uses it for the boundaries element and for why games feel emotionally safe.

In this guide: Chapter 2 (boundaries); Chapter 3 (boundaries).

MEDIA SCHOLAR · USC AND FORMERLY MIT

Henry Jenkins

Convergence Culture (2006) · Transmedia storytelling

Jenkins argues that storytelling has increasingly become 'the art of world building,' creating environments too big to exhaust in one work or even one medium, expanded further by fans. Fullerton cites him on why Star Wars, Star Trek, and World of Warcraft sustain interest across games, films, novels, and fan creations.

In this guide: Chapter 4 (world building).

PRINCIPAL RESEARCHER, SONY PLAYSTATION

Kevin Keeker

User research on Uncharted 4 · Microsoft Game Studios usability group · FarmVille 2, PetVille (Zynga)

A social and personality psychologist who stumbled into usability engineering in 1994, Keeker managed Microsoft Game Studios' usability group, designed Xbox sports titles, researched social games at Zynga, and now improves player experience at Sony. His sidebar argues focus groups are good for generating ideas and poor for validating them because of social pressure and 'group polarization'; evaluate by surveying individuals with concrete alternatives instead.

In this guide: Chapter 6 ('Getting the Most out of Focus Groups' sidebar).

PUZZLE DESIGNER · SHUFFLEBRAIN

Scott Kim

Puzzles for Tetris, Bejeweled, Moshi Monsters · Discover magazine puzzle column · Railroad Rush Hour (ThinkFun) · Heaven & Earth, Obsidian

A full-time puzzle designer since 1990 with degrees in music and computers and graphic design from Stanford, Kim defines a puzzle as 'fun, and it has a right answer.' Borrowing Chris Crawford's ladder (games, puzzles, toys, stories), he advises building a good toy first: players enjoy manipulating Tetris blocks before understanding the goal. He separates rule design (inventing Rubik's Cube) from level design (composing one crossword).

In this guide: Chapter 2 ('What is a Puzzle?' sidebar).

PROLIFIC BOARD GAME DESIGNER

Reiner Knizia

Modern Art · Lost Cities · Tigris & Euphrates · Lord of the Rings (cooperative) · Ra, Ingenious

A mathematician by training, Knizia has published hundreds of games known for elegant mechanics and a light touch with theme. Fullerton quotes his warning that 'starting from the same beginning will frequently lead to the same end,' and uses his cooperative Lord of the Rings as an example of a non-zero-sum game. Frank Lantz names his games as a major inspiration.

In this guide: Chapter 3 (non-zero-sum outcome); Chapter 5 (Lantz); Chapter 6 (opening quote, board games to study).

DIRECTOR, NYU GAME CENTER · COFOUNDER OF AREA/CODE

Frank Lantz

[Drop7](#) · [Pac-Manhattan](#) · [Big Urban Game \(with Salen and Fortugno\)](#) · [Universal Paperclips](#) · [Chain Factor](#)

Lantz studied theater and painting, did computer graphics at R/GA, led design at Gamelab, and cofounded Area/Code, a studio for cross-media and location-based games that Zynga acquired in 2011. Favorites: Go, poker as a martial art, Shadow of the Colossus. For a Sopranos TV game that had to be deterministic yet unsolvable for experts, he designed an NP-complete scoring system. His whole process: 'Start with a fun game, put some stuff in it, then take some stuff out.' Advice: play deeply, 'simplificate,' fail often, persist.

In this guide: Chapter 3 (Big Urban Game); Chapter 5 (Designer Perspective).

ENGINEER · INVENTOR OF THE GAME CARTRIDGE

Gerald Lawson

[Fairchild Channel F \(1976\)](#) · [The swappable game cartridge](#)

Lawson designed the Fairchild Channel F console in the 1970s. Before it, most game systems had their software programmed into the hardware and could never be updated. The Channel F introduced swappable cartridges, so novel that each one had to be approved by the FCC as a new product. His invention became the standard for every future console. Lawson was one of the few African-American engineers working in the industry at the time.

In this guide: Chapter 1 (Designers You Should Know).

PRESIDENT, XEODESIGN · EMOTION RESEARCHER

Nicole Lazzaro

[The 4 Fun Keys](#) · [Research on Myst, The Sims, Diner Dash](#) · [Emotion profiles for EA, Ubisoft, Sony](#)

Trained in cognitive psychology at Stanford and film, Lazzaro opened XEODesign's labs in 1992 and spent 17 years watching players' faces to understand why we play. Her research defines four playstyles, each unlocking different emotions: Hard Fun (fiero), Easy Fun (curiosity), Serious Fun (purpose), and People Fun (amusement, schadenfreude, naches). Best-selling games offer at least three, and players rotate between them. 'People are addictive, not the game.'

In this guide: Chapter 1 (user research); Chapter 9 ('Why We Play Games' sidebar).

FORMER SVP OF GAMES, ZYNGA · EA/MAXIS PRODUCER

Tim LeTourneau

SimCity 3000 · The Sims, The Sims 2 · MySims · FarmVille 2

LeTourneau calls himself a game maker rather than designer; his job is interpreting great designers' work to the screen with a focus on the player. He loves games with interlocking simulation layers, a philosophy learned under the hood of SimCity 3000. He brainstorms across disciplines and mind-maps how systems connect. FarmVille 2 had a beloved water-on-the-board feature that confused players no matter how it was explained, so the team cut it: 'Great design is often the practice of great editing.' Prototypes are disposable: 'sketches, not blueprints.'

In this guide: Chapter 3 (Designer Perspective).

USC PROFESSOR · FORMER NAUGHTY DOG LEAD DESIGNER

Richard Lemarchand

Uncharted 1–3 (lead designer) · A Playful Production Process (2021) · Experimental game advocate

Lemarchand led design on the first three Uncharted games at Naughty Dog before joining USC's Interactive Media & Games Division. His sidebar surveys experimental games (Katamari Damacy, The Marriage, Passage, Braid, Osmos, Dear Esther, Johann Sebastian Joust) and the art movements that inspired them, and offers cures for the blank-sheet problem: pick a random subject, or drop one formal element. His book A Playful Production Process is the other main text in your course.

In this guide: Chapter 6 ('Experimental Gameplay' sidebar); course readings.

Alex McDowell

Minority Report (production design) · Fight Club, Watchmen, Man of Steel · 'Immersive design'

McDowell's production design for Minority Report began with an 'idea summit' of scientists, architects, urban planners, and engineers to define the rules of its world; the gestural screen interface invented for the film by MIT's John Underkoffler later informed real systems like Kinect. He calls his cross-platform, previsualization-driven process 'immersive design' and founded the 5D Institute as a world-building collective spanning film, games, architecture, and science.

In this guide: Chapter 4 (world building).

Jane McGonigal

Reality is Broken (2011) · SuperBetter · World Without Oil, EVOKE · Cruel 2 B Kind (with Ian Bogost) · The Lost Ring (2008 Olympics)

McGonigal was studying theater in graduate school when location-based gaming emerged in 2001 and got hired as a mission designer for the Go Game. The 2001 alternate reality game The Beast, a fully cooperative hive-mind puzzle, inspired everything since. She prototypes with thought experiments and 'Twitter virtual playtests,' and solved her Olympic labyrinth sport during yoga: players could be the walls. SuperBetter, built to heal from her own brain injury, showed in a randomized trial that it reduced depression symptoms. Her advice: seek a real-world positive impact with every game.

In this guide: Chapter 2 (Designer Perspective); Chapter 3 (Cruel 2 B Kind); Reality is Broken (your assigned reading).

Sid Meier

[Civilization \(1991\)](#) · [Sid Meier's Pirates! \(1987\)](#) · [Railroad Tycoon](#) · [Alpha Centauri](#), [Gettysburg!](#)

Legend has it Meier bet his friend Bill Stealey that he could program a better flying combat game than the one they were playing in two weeks. It took longer, but they founded MicroProse and shipped Solo Flight in 1984. Often called the father of PC gaming, he created groundbreaking title after title. Civilization fundamentally shaped PC strategy games, and Pirates! mixed action, adventure, and role-playing while blending real-time and turn-based play. His famous line, quoted in Chapter 9: 'Games are a series of interesting choices.'

In this guide: Chapter 1 (Designers You Should Know); Chapter 9 (Lazzaro's sidebar).

NINTENDO DESIGNER

Shigeru Miyamoto

[Donkey Kong \(1981\)](#) · [Super Mario Bros. \(1985\)](#) · [The Legend of Zelda \(1986\)](#) · [Star Fox](#), [Pikmin](#), [Super Mario 64](#)

Hired out of industrial design school as Nintendo's first staff artist in 1977, Miyamoto was assigned to a submarine game called Radarscope, which had twitch mechanics but no story or characters. He wondered why games couldn't be more like the epic stories and fairy tales he loved as a child, so he invented a beauty-and-the-beast tale about an ape stealing his keeper's girlfriend. That was Donkey Kong, and the hero (originally 'Jumpman') became Mario, perhaps the most recognized character in games. A childhood hike where he stumbled on a hidden lake became the sense of exploration in Zelda. Each new Nintendo console has launched with a Mario game he designed.

In this guide: Chapter 1 (creativity, Designers You Should Know); Chapter 4 (Donkey Kong's dramatic arc).

PIONEER OF 'GOD GAMES'

Peter Molyneux

[Populous \(1989\)](#) · [Syndicate](#), [Theme Park](#) · [Dungeon Keeper](#) · [Black & White](#) · [Fable](#)

As a child, Molyneux toyed with an anthill, tearing it down and watching the ants rebuild, dropping food and watching them appropriate it, fascinated by the power he had over the tiny, unpredictable creatures. In *Populous* you play a deity lording it over tiny settlers in real time with only indirect control, a revolution that influenced the real-time strategy games that followed. *Black & White* explored free will in an AI creature that learns from your treatment of it.

In this guide: Chapter 1 (Designers You Should Know); Chapter 4 (free will vs. player control in *Black & White*).

BOARD GAME DESIGNER

Alan R. Moon

[Ticket to Ride \(2004\)](#) · [Elfenland \(1998\)](#) · [Union Pacific](#), [San Marco](#) · [10 Days in the USA](#) · [Airlines \(1990\)](#)

Hired by Avalon Hill to edit its magazine, Moon ended up developing games, then moved to Parker Brothers' video division before going independent. It took him 14 years to have real success as a designer. His favorites include *Descent*, *Carcassonne: Hunters & Gatherers*, *Adel Verpflichtet*, *Love Letter* ('the elegance of simplicity'), and an ordinary deck of cards; his biggest influence was Sid Sackson's *Acquire*. Advice: play everything ('it's research'), build a core group of playtesters, learn when to let a design go, and learn to deal with rejection.

In this guide: Chapter 5 (Designer Perspective).

Dr. Ray Muzyka

Baldur's Gate, Baldur's Gate II · Neverwinter Nights · Star Wars: Knights of the Old Republic · Mass Effect, Dragon Age · Jade Empire

Muzyka trained and practiced as an emergency-room and family doctor while co-founding BioWare in 1995 with Dr. Greg Zeschuk and Dr. Augustine Yip. Their second game, Baldur's Gate, was a hit, and by his retirement in 2012 the EA-owned BioWare label had more than 1,400 employees. Every favorite game of his shares two traits: emotionally engaging and very high quality. Advice: be passionate but self-critical and humble about feedback, recognize diminishing returns, and hire smart people and treat them extremely well.

In this guide: Chapter 4 (Designer Perspective).

LEAD DESIGNER, RIOT GAMES

Christina Norman

Mass Effect 2 and 3 (combat design) · League of Legends · Mass Effect (2007)

Norman became a designer at age nine when her Dungeons & Dragons group's dungeon master moved away and she'd already memorized the rules. After an unfulfilling career programming e-commerce sites, she applied to BioWare as a designer, was rejected, got in as a programmer, and eventually talked the lead designer into a shot. On Mass Effect 2 she rebuilt combat: in the first game an invisible die roll decided hits so guns felt weak; making them feel great required reinventing nearly every system. Her rule: 'I don't build games for myself.' Watch other people play, and listen to teammates regardless of title.

In this guide: Chapter 1 (Designer Perspective).

Celia Pearce

[Communities of Play](#) (MIT Press, 2009) • [Virtual Adventures: The Loch Ness Expedition](#) • Cofounder of IndieCade

Pearce designed the award-winning VR attraction Virtual Adventures and wrote Communities of Play about emergent cultures in multiplayer worlds. She conducted the Will Wright interview in Chapter 6 for the journal Game Studies. She is an associate professor of game design at Northeastern University, Zach's school, and cofounded the IndieCade festival of independent games.

In this guide: Chapter 6 ('A Conversation with Will Wright').

ARCHITECT AND INSTALLATION ARTIST

Nathalie Pozzi

[Interference](#) (with Eric Zimmerman) • [Playable installations in Paris, Berlin, Moscow, MoMA](#)

Pozzi's work crosses architecture, installation, and art, exploring space, light, material, and culture. Her collaborations with Eric Zimmerman are physical games shown at museums and festivals. Their playtesting primer, written during a residency at the University of the Arts Berlin with fellows from theater, sound, and philosophy, shows that playtesting is a methodology any participatory art can borrow.

In this guide: Chapter 2 (Interference); Chapter 9 ('A Primer for Playtesting' sidebar).

Brenda Romero

Wizardry series · Jagged Alliance · The Mechanic is the Message series (Train, Síochán Leat, One Falls for Each of Us) · Dungeons & Dragons at Atari

Romero began at Sir-tech Software in 1981, working up from testing to designing Wizardry 8, then moved to Atari for Dungeons & Dragons. A passionate advocate for diversity in the industry, she received the Game Developers Conference Ambassador Award and a special BAFTA. Her analog series The Mechanic is the Message asks whether rules alone can carry difficult emotions. It began the day her seven-year-old daughter Maezza came home reciting facts about the Middle Passage with no feeling; a spontaneous game with wooden pawns, an index-card boat, and pennies for food brought the connection home. Train, her best-known piece, is housed in the National Museum of Play. 'Pure mechanic is pure player.'

In this guide: Chapter 1 (Designers You Should Know); Chapter 3 (The Mechanic is the Message sidebar).

Katie Salen

Rules of Play (with Eric Zimmerman) · Big Urban Game (with Frank Lantz and Nick Fortugno) · Quest to Learn school · Gamestar Mechanic, Connected Camps

Salen fell into games through a student project on Texas Lottery tickets as social interfaces. With Eric Zimmerman she wrote Rules of Play, the source of the definition 'free movement within a more rigid structure.' She designed Quest to Learn, a New York public school built on game-based learning, and cofounded Connected Camps. Her Big Urban Game sent giant inflatable pieces racing through Minneapolis; balancing that five-day race led to a giant-dice power-up so trailing teams could catch up. She starts every design by defining exactly what a player should experience and physically do.

In this guide: Chapter 2 (definition of play); Chapter 3 (Big Urban Game); Chapter 7 (Designer Perspective).

DESIGNER AND PRODUCER, MICROSOFT

Nahil Sharkasi

Kinect Fun Labs, Kinect Star Wars · Halo 5: Guardians, Halo 5: Forge · Windows Mixed Reality Home

A former journalist and documentary filmmaker, Sharkasi discovered games volunteering in USC's Game Innovation Lab on a constitutional-history game for public broadcasting. She loves games that blur real and virtual, like Sharkrunners, driven by GPS-tagged real sharks. Her teams prototype 'lo-fi to hi-fi,' a day or two per idea down a prioritized list. On Kinect Star Wars she got achievement certification rules rewritten because they predated the technology. Advice: 'Make.'

In this guide: Chapter 12 (Designer Perspective).

CREATIVE DIRECTOR, TIGER STYLE

Randy Smith

Thief: The Dark Project, Thief II · Thief: Deadly Shadows · Spider: The Secret of Bryce Manor · Waking Mars

Smith compiled a list of every game company he wanted to work for, put Looking Glass Studios at the top, and cold-called the director of the game that became Thief. Hired as a hybrid designer-programmer, he was pushed into pure design. In 2009 he founded Tiger Style to prove casual audiences are ready for sophisticated concepts and to make engaging action games without violence. His process gathers ideas top-down (themes like Waking Mars' ecosystems), bottom-up (a heart-shaped locket thrown down a well), and laterally. Advice: 'Don't do what everyone else is doing.' Games don't have to be fun, fair, balanced, or 'addictive.'

In this guide: Chapter 2 (Designer Perspective).

Warren Spector

Deus Ex (2000) · System Shock (1994) · Thief: Deadly Shadows · Ultima VI and VII, Wing Commander · Disney Epic Mickey

Spector started in 1983 as an editor at Steve Jackson Games, working on TOON, GURPS, Car Wars, and Ogre, then moved to TSR (Dungeons & Dragons) and in 1989 to Origin Systems, where he worked with Richard Garriott on the Ultima series and rose from associate producer to executive producer. He pioneered 'free-form' gameplay that lets players choose their own path, culminating in Deus Ex, considered one of the finest PC games ever. Games, he says, are 'an experiential shoe store' that let you walk in anyone's shoes. His advice: learn to program, get a broad education, and above all make games. 'There's no room here for dilettantes!'

In this guide: Chapter 1 (Designers You Should Know and Designer Perspective); Chapter 7 (board-game designers turned digital).

PHILOSOPHER · THE GRASSHOPPER (1978)

Bernard Suits

The Grasshopper: Games, Life and Utopia · The 'lusory attitude' · The voluntary attempt to overcome unnecessary obstacles'

Suits, a philosophy professor at the University of Waterloo, argued against Wittgenstein that games can be defined. His definition, playing a game is 'the voluntary attempt to overcome unnecessary obstacles,' is the one Jane McGonigal calls the most convincing ever devised. The 'lusory attitude' (from the Latin for game) is the curious state in which players adopt rules that require worse rather than better means to reach an end. His example is golf: you could drop the ball in the hole by hand, but you walk 400 yards away and hit it with a stick.

In this guide: Chapter 2 (lusory attitude); Reality is Broken.

Brian Sutton-Smith

[The Ambiguity of Play \(1997\)](#) · 'The opposite of play isn't work. It's depression.'

A New Zealand-born psychologist and folklorist, Sutton-Smith spent his career cataloguing children's games and the many rhetorics people use to talk about play. His list of play forms (mind play, solitary play, social play, performance play, contest play, risky play) appears in Chapter 4, and his line about depression anchors McGonigal's argument that gameplay is the emotional opposite of depression.

In this guide: Chapter 4 (nature of play); Reality is Broken.

DESIGNER OF KATAMARI DAMACY

Keita Takahashi

[Katamari Damacy \(2004\)](#) · [We Love Katamari](#) · [Noby Noby Boy](#) · [Wattam](#)

An artist and sculptor at Namco, Takahashi was assigned to design a racing game and instead 'came up with' the idea of a sticky ball that rolls up everything from paper clips and sushi to palm trees and policemen. He cites inspirations as different as Picasso, John Irving, Playmobil toys, and the Japanese children's game tamakorogashi. Nobody believed rolling a ball would be fun until they played his prototype. He has said he'd like to design a playground for children, 'undulating, with bumps.'

In this guide: Chapter 1 (creativity); Chapter 3 (resources: paper clips and sushi); Chapter 7 (the persuasive prototype).

DESIGNER OF SETTLERS OF CATAN

Klaus Teuber

[The Settlers of Catan \(1995\)](#) · [Barbarossa](#), [Adel Verpflichtet](#)

A German dental technician turned designer, Teuber created Catan, the game that introduced much of the world to modern German-style board games. Fullerton uses its economy as the model of complex bartering: resource values fluctuate with supply and demand, the bank's 4:1 trade caps prices, trades happen only on your turn, and the seven-roll penalty is a balancing loop that keeps rich players from running away.

In this guide: Chapter 5 (economies, feedback loops); Chapter 6 (board games to study).

Dennis Wixon

Metrics research on Halo, Crackdown, Age of Empires · Microsoft Studios User Research

Wixon founded and managed the user research group at Microsoft Game Studios, which built custom tools to record play data and visualize it as heat maps. His sidebar distinguishes behavioral metrics (what people do) from attitudinal metrics (what they report) and shows how 'operationalizing' a concept like puzzle difficulty makes the team's intention testable. The Crackdown case study, where agility orbs lifted the fun rating from 3.8 to 4.5, is his group's work. He now teaches at USC.

In this guide: Chapter 1 (user research); Chapter 9 ('Metrics in Game Design' sidebar).

COFOUNDER OF MAXIS · SIMULATION PIONEER

Will Wright

SimCity (1989) · SimAnt, SimEarth · The Sims (2000) · Spore (2008)

In 1987 Wright made a helicopter game, Raid on Bungling Bay, and had more fun building the little cities on the islands than attacking them. Publishers said nobody would buy a game about building a city; SimCity became a breakout hit with no set goals and creation instead of destruction. His curiosity about how the world works drove SimAnt (ant colonies), SimEarth (the Gaia hypothesis), and The Sims (Maslow's hierarchy of needs), the best-selling PC game of all time. His favorite game is Go: two rules, endless complexity. He designs for a large 'solution space' so each player's solution feels their own, and when players do things he never planned, 'that feels like success.'

In this guide: Chapter 1 (inspiration); Chapter 5 (emergence in The Sims); Chapter 6 (the Celia Pearce interview).

Eric Zimmerman

Rules of Play (with Katie Salen) · SiSSYFiGHT 2000 · Diner Dash (Gamelab) · Quantum, The Metagame · Interference (with Nathalie Pozzi)

A twenty-year industry veteran, Zimmerman cofounded the New York studio Gamelab, which helped invent casual games with Diner Dash, and is a founding faculty member of the NYU Game Center. With Katie Salen he wrote Rules of Play, the scholarly synthesis Fullerton draws on for the definition of play and the idea that game design is a 'second-order' problem. His SiSSYFiGHT 2000 case study shows iterative design from Post-it notes to an online community, and his playtesting rules with Nathalie Pozzi ('Shut up,' 'Hunger for failure,' 'Break these rules') appear in Chapter 9.

In this guide: Chapter 1 (iterative design sidebar); Chapter 2 (Rules of Play, Interference); Chapter 5; Chapter 9 (playtesting primer).
