

Game designer of Pac-Man World™ and Maximo™ series

SCOTT ROGERS

2ND
EDITION



NEW
CONTENT
THROUGHOUT



Level
UP!

THE GUIDE TO GREAT
VIDEO GAME DESIGN

WILEY

Free 2 Play

Fun and UNFUN

Gameplay as Story

Mobile Gaming

What Gamers Want

Level Up!

The Guide to Great

Video Game Design

2nd Edition

Scott Rogers

WILEY

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Contents

INTRODUCTION

Press Start!	1
If You Are Anything Like Me	1
No, You Can't Have My Job	3
Who Is This Book For?	4
Why a Second Edition?	6

LEVEL 1

Welcome, NOObS!	7
A Brief History of Video Games	10
The Brave New World of Gaming: Mobiles, Online Distribution, and Touchscreens	14
Game Genres	16
Who Makes This Stuff?	17
Programmer	18
Artist	19
Designer	20
Producer	20
Tester	21
Composer	22
Sound Designer	23
Writer	23
Have You Thought about Publishing?	25
Product Manager	25
Creative Manager	25
Art Director	26
Technical Director	26
Marketing Team	26
And the Rest	26

LEVEL 2

Ideas 29

 Ideas: Where to Get Them and Where to Stick Them 30

 Getting Ahead of the Game. 32

 What Do Gamers Want? 35

 Brainstorming 36

 Breaking Writer’s Block 38

 Why I Hate “Fun” 40

LEVEL 3

Writing the Story 43

 Once Upon a Time 43

 The Triangle of Weirdness 50

 A Likely Story. 52

 Time to Wrap It Up. 55

 A Game by Any Other Name. 56

 Creating Characters Your Players Care About 58

 A Few Pointers on Writing for Kids of All Ages 62

 Writing for Licenses 62

LEVEL 4

You Can Design a Game, but Can You Do the Paperwork? 65

 Writing the GDD, Step 1: The One-Sheet 68

 ESRB Ratings 69

 Unique Selling Points 70

 Competitive Products 70

 Writing the GDD, Step 2: The Ten-Pager. 71

 The Rule of Threes 72

 The Ten-Pager Outline 73

 Page 1: Title Page 73

 Page 2: Game Outline 73

 Page 3: Character 74

 Page 4: Gameplay 75

 Page 5: Game World. 76

 Page 6: Game Experience 76

 Page 7: Gameplay Mechanics 77

 Page 8: Enemies 79

 Page 9: Multiplayer and Bonus Materials. 80

 Page 10: Monetization. 80

Writing the GDD, Step 3: Gameplay Progression	81
Writing the GDD, Step 4: The Beat Chart	82
Writing the GDD, Step 5: The Game Design Document (and the Awful Truth about Writing It)	85
Writing the GDD, Step 6: Above All, Don't Be a Jerk	89

LEVEL 5

The Three Cs, Part 1: Character. 93

Who Do You Want To Be Today?	94
Personality: Do We Really Need Another Kratos?	96
Let's Get Personal	98
Using All the Parts	102
Games Without Characters	103
We Are Not Alone	104
When More Is More	107
Who Are the People in Your Neighborhood?	109
Finally, We Talk About Gameplay	111
Metrics for Non-Characters	114
Be Kind to Our Four-Legged Friends	114
Why Walk When You Can Run?	114
The Art of Doing Nothing.	119
Might as Well Jump	120
Hoists and Teeters.	124
What Goes Up Must Fall Down.	125
Me and My Shadow.	126
The Water's Fine . . . or Is It?	127

LEVEL 6

The Three Cs, Part 2: Camera 131

Get It Right: Camera Views	132
First Person Camera	136
Third Person Camera	138
Giving Up Control.	142
So You've Decided to Let the Player Control the Camera	142
So You've Decided Not to Let the Player Have Control over the Camera	144
So You've Decided to Let Players Sometimes Have Control over the Camera.	145
Two and a Half D	145
Isometric Camera	146

Top-Down Camera	148
AR Cameras	149
Special Case Cameras	149
Tunnel Vision	150
Camera Shot Guide	150
Camera Angle Guide	153
Camera Movement Guide	154
Other Camera Notes	157
Always Point the Camera to the Objective	158
Never Let the Character Get out of the Camera's Sight	159
Multiple-Player Cameras	159

LEVEL 7

The Three Cs, Part 3: Controls	163
Control Is in Your Hand	164
You've Got the Touch	167
Dance, Monkey, Dance	169
Character or Camera Relative?	175
Shake, Rattle, and Roll	177

LEVEL 8

Sign Language: HUD and Icon Design	181
Heads Up!	181
Health Bar	182
Targeting Reticule	183
Ammo Gauge	184
Inventory	185
Score/Experience	185
Positive Messaging	186
Radar/Map	187
Context-Sensitive Prompts	188
The Clean Screen	190
Icon Has Cheezburger?	191
Creating Icons for Mobile Games	194
Don't Get QTE	196
HUDs and Where to Stick 'Em	198
There Are Other Screens Than the HUD	199
A Final Word on Fonts	207

LEVEL 9

Everything I Learned About Level Design, I Learned from Level 9	209
The Top 10 Cliché Video Game Themes	212
The Name Game	218
Everything I Learned About Level Design, I Learned from Disneyland	220
Mapping the World	221
Foreshadowing	222
Goal Setting	223
Following Procedure	225
You've Got the Beat	227
Re-using Re-use	229
The Gary Gygax Memorial Mapping Section	230
Sandbox Play	233
Illusional Narrative	236
The Dave Arneson Memorial Mapping Section	237
Wrapping Up Mapping	248
Gray Matters	251
Leave the Training Level for Last	253
Levels without Characters	254

LEVEL 10

The Elements of Combat	257
400 Quatloos on the Newcomer!	259
Put 'Em Up!	262
And a One and a Two	266
The Big Finish	268
Live by the Sword	270
Now You Have to Kiss Me	273
Let's Get Defensive	273
Dodging the Bullet	276
On Guarding	277
State of the Art Bang Bang	281
The Best Gun for You	286
Run and Gun	290
Not Just Shooting	293
Dang it, Jones! Where <i>Doesn't</i> It Hurt?	297
Death: What Is It Good For?	299
Conflict Without Combat	301

LEVEL 11

They All Want You Dead	305
Sizing Up the Enemy	307
Bad Behavior	308
How Rapid is Rapid?	313
Movement Style	316
Bring on the Bad Guys	318
I Love Designing Enemies	327
The Alphabetical Bestiary of Choices	328
I Hate You to Pieces	337
Non-Enemy Enemies	341
How to Create the World's Greatest Boss Battle	342
Who's the Boss?	342
Size Matters	344
Location, Location, Location.	349
Why Not to Create the World's Greatest Boss Battle	351

LEVEL 12

The Nuts and Bolts of Mechanics.	353
The Mechanics of Mechanics.	353
Holy Death Trap!	357
What I Learned from Making Kids Cry	360
Time to Die	361
The Music of Mechanics.	364
Chip Off the Old Block	368
A Nice Little Calm Spot	371
Riddle Me This.	372
Puzzle Me That	375
Minigames and Microgames	377

LEVEL 13

Now You're Playing with Power	381
Powering Up	381
"Love Thy Player"	388
Seriously. "Love Thy Player."	390
More Wealth Than You Can Imagine!	391
High Score.	394
Achievements	395

Money! Money! Money!	395
Souvenirs	399
Bonus Section about Bonus Features.	400
How to Win at Losing.	402
LEVEL 14	
Multiplayer—The More the Merrier.	405
How Many Is the Right Number?	410
MMORPGS, or Hell Is Other People	410
Designing Multiplayer Levels	415
Planning Your Level	415
Mapping Your Level	416
Building Your Level	417
The Dirty Half Dozen	418
LEVEL 15	
Everybody Wins: Monetization	419
Cashing In	422
Money Is the Root of Something Something	423
LEVEL 16	
Some Notes on Music.	427
I Know It When I Hear It	429
Music with Style	430
And the Beat Goes On.	431
Sounds Like a Game to Me	434
LEVEL 17	
Cutscenes, or No One's Gonna Watch 'Em Anyway	441
A Cut Above	442
How to Write a Screenplay in Eight Easy Steps	444
Finding Your Voice	448
LEVEL 18	
And Now the Hard Part	451
No One Cares About Your Stupid Little World	452
Who's Paying?	455

Video Games Is a Haaaard Business.....456

 When Reality Gets in the Way.....457

 Emergent, Vertical, or Horizontal?.....459

 What to Do for an Encore?462

Continue?..... 467

 Time to Level Up!467

BONUS LEVEL 1

The One-Sheet Sample..... 469

BONUS LEVEL 2

The Ten-Page Design Document Sample 473

BONUS LEVEL 3

Game Design Document Template..... 485

BONUS LEVEL 4

The Medium-Sized List of Story Genres 493

BONUS LEVEL 5

Game Genres 495

BONUS LEVEL 6

The Big List of Environments 503

BONUS LEVEL 7

Mechanics and Hazards 507

BONUS LEVEL 8

Enemy Design Template..... 509

BONUS LEVEL 9

Boss Design Template 511

BONUS LEVEL 10

High-Concept Pitch Presentation..... 513

BONUS LEVEL 11

Achievement Unlocked: Exactly Like Making Chili 521

Index..... 523

Foreword

LIKE A MAGICIAN laying bare the means with which he amazes his audience, Scott Rogers in this, the second edition of *Level Up!* reveals the tricks of the trade for creating compelling video games.

A number of game designers have attempted this feat in the past, but Scott's great book provides something rare and important: a breaking down of and then a deep dive into the specific elements that must come together to create engaging interactive entertainment.

The fact that this book does that important work with a breezy, fun writing style and silly cartoons is a testament to Scott's abilities as a game designer; for the best designers are always aware that no matter how complicated the section of gameplay, the most important rule is to keep things engaging! This book—like Scott's games—does that in spades!

Readers across the spectrum of experience will find much to love and learn in this fun, giant, and necessary book. Folks new to the medium will be amazed at just how much thought goes into creating 'fun.' And experienced game designers who, like myself, have been doing this stuff by gut for decades will be stunned as they discover that there is indeed a method to the madness. Many times reading this book I caught myself thinking, "Oh, THAT'S why that works!"

As you turn the page, know that you are in for a treat! I look forward to playing the games you create after having taken in the great knowledge this book contains!

Best of luck—and enjoy!

David Jaffe, Creative director of the *Twisted Metal* series and *God of War* San Diego, CA
December 2013

Press Start!

If You Are Anything Like Me . . .

. . . **YOU READ THE** first page of a book before you buy it. I find that if I like the first page, I'll probably like the whole thing. I have noticed that many books have an exciting excerpt on the first page in order to grab the reader's interest, such as:

The skeleton dragon grabbed the helicopter with bony talons and shook it so hard that Jack's teeth rattled. Evelyn fought at the controls, attempting any maneuver that would free the copter from beast's unyielding clutches. "Hang on!" she screamed over the engine's tortured whine. "We're going down!" The world whirled around and around as the copter and dragon performed a death waltz. Jack didn't remember the copter slamming hard into the skyscraper or the crash or the dragon's bones raining down or being thrown from the wreckage—until Evelyn shook him into consciousness. "Jack! Jack!" she said. "We need to move. Now!" "What's the hurry, Sis? That dragon's toast." Then his eyes finally focused. On the cemetery gate. On the crooked gravestones. On the zombies pulling themselves from the dirt. Jack thought, "Nuts. I should have never opened that book."

Not that I would ever resort to such cheap tactics in *this* book. I have also noticed that some books try to gain respectability by publishing a positive quote from an industry professional or famous person on their first page:

I learned more from reading the first page of the second edition of Level Up! The Book of Great Video Game Design than I learned from working for 25 years in the video game industry!
—A very famous game designer¹

¹ No doubt you are smart enough to have realized that this isn't a real quote, because there isn't a very famous game designer. Unless you count Shigeru Miyamoto, the creator of Mario. Drat! I should have translated the quote into Japanese!

You obviously don't need someone else to tell you how to make up your mind. Just by picking up this book, I can tell you are a discriminating reader. I can also tell you are seeking the straight truth on the creation of video games. This book will teach you the who, what, where and, most importantly, how to design video games. If you have an interest in arcade games, boss fights, chili, deadly traps, ergonomics, fun, giant hydras, haunted mansions, islands and alleys, jumps, killer bunnies, leitmotifs, Mexican pizza, non-player characters, one-sheet designs, pitch sessions, quests, robotic chickens, smart bombs, the triangle of weirdness, un-fun, violence, whack-a-mole, XXX, Y-axis and zombies, then this is the book for you.

Before we start, keep in mind that there are many ways to approach game design. All of them are valid, as long as they can communicate the designer's ideas. The tricks and techniques found in this second edition of *Level Up!* are MY WAYS of creating game design.

Another quick reminder: when I say "I designed a game," this is an oversimplification. Video games are created by many, many, many talented people (you'll be introduced to them shortly) and to give the impression that I did all the work myself is not only incorrect but egotistical.² There is no "I" in team.³

The majority of the games I've helped design were single player action games, so many of the examples found in this edition of *Level Up!* are skewed towards that perspective. It's just the way I think. But I have also found that most of the gameplay concepts are transferable to many different genres of games. It won't be too hard for you to translate my advice to your own game, no matter what the genre.

Another thing before we get started. If you are looking for a single chapter about gameplay, don't bother. Because EVERY chapter in this book is about gameplay. You should be thinking about gameplay all the time and how things affect the player, even when designing passive elements like cutscenes, monetization models, and pause screens.

Since you have made it this far, I may as well start by actually telling you the bad news first. Making video games is very hard work.⁴ I have worked in video games for over 20 years and on games that have sold millions of copies.

But in that time, I have learned that making video games is also the best job in the world. It can be thrilling, frustrating, rewarding, nerve-wracking, hectic, boring, vomit-inducing, and just plain fun.

² It's a small industry. No one can afford to make enemies! Be a nice, hardworking person and you'll go far.

³ Ironically, there is a "me."

⁴ I once had an employer who would walk the halls of our office muttering how "video games are a haaaard business." I used to laugh at him back then, but I don't any more. He was right.

No, You Can't Have My Job

Over the course of my career, I came up with some **Clever Ideas** and learned some **Universal Truths**. For your convenience, I have added these at the end of each “level.”

I also learned a couple of **very important things**. You can tell they are **very important** because they are written in all uppercase letters. The first **very important thing** I learned was:

GAME DESIGNERS HAVE MORE FUN

I know this, because my first job in the video game industry was as an artist.⁵ Back in those 16-bit days, video game artists drew images with pixels. There are several great 16-bit artists, like Paul Robertson and the teams that made the Metal Slug and classic Capcom fighting games; but for me, drawing pictures out of pixels is like drawing with bathroom tiles. Here is what a drawing I made out of pixels looks like:



Anyway, as I was “pushing pixels” I heard the sound of raucous laughter coming from the group of cubicles next to mine. I peered over the wall to see a bunch of video game designers yukking it up and have a good ol’ time. For the record, I was not having a good ol’ time pushing pixels. I realized, “Those game designers are having more fun than I am! Making video games should be fun! I want to have fun! I want to become a game designer too!” And so I did. I eventually worked my way up the ladder to become a game designer. After I became a real game designer, I learned the second **very important thing**:

NO ONE ON YOUR TEAM WANTS TO READ YOUR DESIGN DOCUMENT

This is a horrible thing to discover, but it is something every game designer needs to hear. Here I was, a brand new game designer with brand new game designs ready to go, and no one wanted to read any of them! What was I to do? In order to solve this problem and get my

⁵ Actually we were called “pixel pushers” and “sprite monkeys,” neither of which, despite how cute those terms sound, were ever meant as a compliment.

colleagues to read my design documents, I started drawing them as cartoons. And guess what? It worked. They conveyed the ideas I wanted to get across to my teammates. And I've been designing games this way ever since, many of which have gone on to become top-selling titles. That is why you will find many cartoons, so you will continue reading and understand the ideas presented. If you do, then you can apply them to your own design and become a great designer, too.



Who Is This Book For?

Why *you*, of course. Provided you are one of the following people.

A working video games professional. There are lots of books about video game design, but most of them are full of THEORY, which I have never found very helpful while making a game. Don't get me wrong, theory is great when you are at a game developers conference or one of those wine and cheese affairs we game designers always find ourselves at. But when I am working on a game, with my sleeves rolled up and blood splattered all over the walls,⁶ I need practical nuts n' bolts advice on how to solve any problems I may encounter.

⁶ Figurative blood. To my knowledge, no one has died from making a video game.

I mention this because I assume that some of you reading this second edition of *Level Up!* will be experienced video game professionals. I hope you find the techniques and tips in this book useful in your day-to-day work. Not that this book doesn't have uses for beginners.

I'm talking about you, **future video game designers**. Remember, one page ago when I told you I was a pixel pusher? There was a point to that story, which is *I was just like you*. Maybe you're also an artist who is tired of hearing the game designers laughing it up over in the other office. Or a programmer who knows he can design a better enemy encounter than the knucklehead currently doing it on your game. Or maybe you are a tester who wants to move up in the world, but you don't know how to do it. When I wanted to become a video game designer, there weren't any books on the subject. We had to learn everything from other game designers. I was lucky to have a mentor and an opportunity to work as a game designer. If you don't have either of these things, don't fret. Read this book; I will be your mentor. All *you* need to do is follow my advice, be prepared, and take advantage of the opportunity when it finally arrives.

This book is also great for **students of video game design**. Back when I started making games, I didn't take any classes on video game design—because they didn't exist! I just made stuff up as I went along! And I made a lot of mistakes. This is why I wrote this book: so you can learn from all **my** mistakes before they become **your** mistakes too.

Finally, this book is for **anyone who loves video games**. I love video games. I love to play them. I love to make them and I love to read about making them. If you want to make video games, then you must love them too. Ironically, I know several people who work in video games that freely admit they do not like to play video games. That does not make any sense to me. Why would you work in video games if you do not love video games? They are fools. They should just step aside and let someone who loves video games make video games. Someone like you.



Why a Second Edition?

When I first wrote *Level Up! The Guide to Great Level Design* back in 2009, the gaming industry was a different place. Consoles were the undisputed kings, motion controls had just hit the scene, social gaming on Facebook was still becoming a thing, and the app store had just launched the year before.

Things move very fast in the gaming industry. No one was anticipating the popularity of mobile gaming, the importance of monetization, or the explosion of the indie gaming market. Looking over the first edition, I realized many topics needed to be added, content needed to be updated, references modified, concepts re-explored. I hope that you find that this updated edition provides enough new information to warrant a second purchase for returning readers or a first for new ones.

At the very least, make sure to try the new chili recipe.

Level 1

Welcome, N00bs!

THIS CHAPTER IS written especially for people who are new to video games and how they are made. I talk about what is a game, who makes them, and what kinds of games there are. It's pretty basic stuff and if you already know it all and are not a n00b,¹ feel free to skip it. However, you are going to be missing out on a lot of great stuff. Don't say I didn't warn you.

Within the academic gaming community, there are many different definitions for what qualifies as a game. Some scholars insist that “a game needs to be a closed formal system that subjectively represents a subset of reality.”² Others say that games need to have “players in conflict with each other.”³ I think those definitions are trying too hard to sound smart.

Game definitions are often simpler than that. Bernard Suits wrote that “playing a game is a voluntary effort to overcome unnecessary obstacles.”⁴ This is a pretty amusing definition, but still a bit too scholarly for my taste. Let's keep things simple. Let's consider hand ball. You need only one player for hand ball. Where are the other players to be in conflict with? Bouncing a ball against a wall without missing it is hardly a metaphor for reality—unless you lead a very boring life. Let's face it, sometimes a ball bouncing against a wall is just a ball bouncing against a wall.

¹ The term “n00b” is short for “newbie,” or someone who is new to a game or other venture. While the term predates the Internet, it became popular with MMORPG communities. Not a particularly flattering term, as it implies inexperience and/or ignorance. For example, only a real n00b would read a footnote defining what a n00b is!

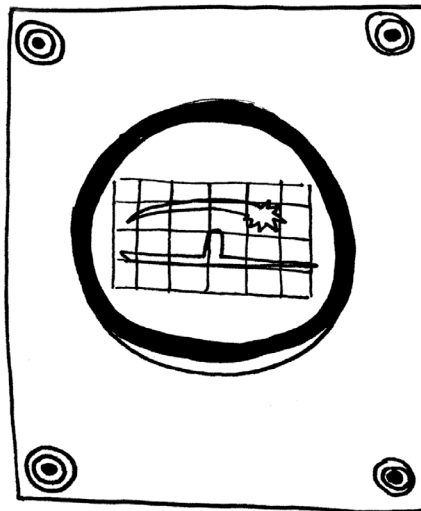
² “What Is a Game?” Chris Crawford in *The Art of Computer Game Design*, McGraw-Hill/Osborne Media, 1984.

³ “What Is a Game?” Roger Lewis in *The New Thesaurus*, Putnam Pub Group, 1979.

⁴ *The Grasshopper: Games, Life and Utopia*, Bernard Suits, University of Toronto Press, 1978.



Playing hand ball may therefore seem like a time-waster, but a time-waster becomes a game when you add rules and an objective. A rule may be to throw the ball with your right hand and catch it with your left, or to not drop the ball. A victory condition could be that you have to catch the ball ten times in a row. A failure state would be if you violated any of the rules or victory conditions. When those criteria have been met, you have created a game. Ironically, while simple, hand ball was enough of a game to inspire the creators of one of the earliest video games: *Tennis for Two*.



Tennis for Two

So, let's ask this basic question:

Q: What is a game?

A: A game is an activity that

- Requires at least one player
- Has rules
- Has a win and/or lose condition

That's pretty much it.⁵

Now that you know what a game is, let's ask:

Q: What is a video game?

A: A video game is a game that is played on a video screen.

Sure, you can start complicating the definition and add requirements about devices, peripherals, control schemes, player metrics, boss fights, and zombies (and don't worry; we'll tackle these things soon enough). But by my reckoning, that is pretty much as simple as it gets.

Oh, there's one other thing to consider at this early stage. A game needs a clear **objective** so the player knows what the goal is. You should be able to sum up a game's objectives quickly and clearly. If you can't, you've got a problem.

Danny Bilson, THQ's former EVP of Core Games, has a great rule of thumb about a game's objective. He says that you should be able to sum up the game's objectives as easily as those old Milton Bradley board games did on the front of their box. Check out these examples taken from real game boxes:

- *Battleship*: Sink all of your opponent's ships.
- *Operation*: Successful operations earn "Money." Failures set off alarms.
- *Mouse Trap*: Player turns the crank, which rotates gears, causing lever to move and push the stop sign against shoe. Shoe tips bucket holding metal ball. Ball rolls down rickety stairs and into rain pipe, which leads it to hit helping hand rod. This causes bowling ball to fall from top of helping hand rod through thing-a-ma-jig and bathtub to land on diving board. Weight of bowling ball catapults diver through the air and right into wash tub, causing cage to fall from top of post and trap unsuspecting mouse.

⁵ A game should also be fun, although it's not mandatory . . . but we'll talk about that later.

Okay, let's just ignore that last one. The lesson is, you need to keep your game objectives simple. Speaking of simple games, let's take a moment to travel back to the dawn of video games. They had to start somewhere, right?

A Brief History of Video Games

The 1950s. The dawn of television, 3-D movies, and rock 'n' roll. Video games were invented in the 1950s too, only they were played by very few people, on very large computers. The first video game programmers were students in the computer labs of large universities like MIT and employees of military facilities at Brookhaven National Laboratories. Early games like *OXO* (1952), *Spacewar!* (1962), and *Colossal Cave* (1976) had very simple or even no graphics at all. They were displayed on very small black-and-white oscilloscope screens.

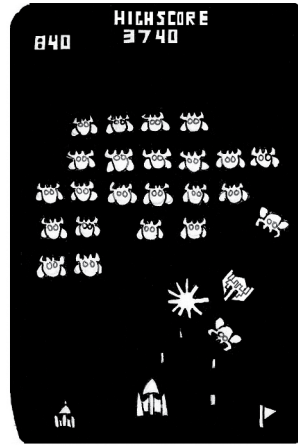


After playing *Spacewar!* at the University of Utah's computer lab, future Atari founders Ted Dabney and Nolan Bushnell were inspired to create *Computer Space*, the first **arcade** video game, in 1971. While (despite the name) the first arcade games could be found in bars, arcades dedicated to video games began appearing by the late 1970s.

Early arcade games were rendered using either **vector graphics** (images constructed from lines) or **raster graphics** (images constructed from a grid of dots called pixels). Vector graphics allowed for bright, striking images like those seen in *Battlezone* (Atari, 1980), *Tempest* (Atari, 1981) and *Star Wars* (Atari, 1983) while raster graphics spawned cartoon-inspired characters like Pac-Man (Namco, 1980) and Donkey Kong (Nintendo, 1982). These early characters became pop culture icons overnight; appearing in everything from cartoons and t-shirts to pop-music and breakfast cereals.



Asteroids
(Vector Graphics)

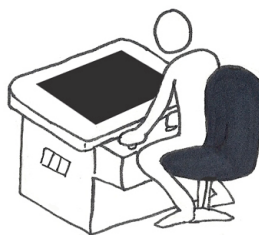


Galaxian
(Raster Graphics)

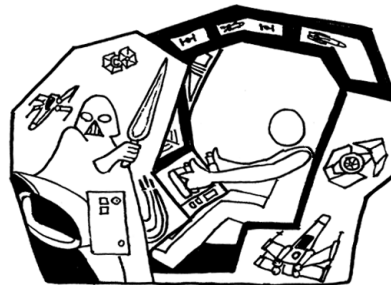
During the early 1980s, three styles of game machines dominated arcades: **uprights** (cabinets which the player stood in front of while playing), **cocktail tables** (arcade games set into the top of a small table, allowing the player to sit down while playing), and **cockpits** (elaborate game cabinets that allowed the player to lean or sit down to further enhance the gaming experience).



Upright Cabinet



Cocktail Table



Arcade Cockpit

In the mid-1980s, arcades began springing up everywhere, and video games took the world by storm. Game genres and themes became more varied, while gaming controls and cabinets became more elaborate with realistic controllers and beautiful graphics decorating uniquely designed cabinets. You could sit back to back in a two-player spaceship cockpit while playing *Tail Gunner* (Vectorbeam, 1979), battle Klingons from a replica of Captain Kirk's command chair in *Star Trek* (Sega, 1982), or "drive" in a miniature Ferrari Testarossa that moved and shook in *Out Run* (Sega, 1986). By the late 1990s, many arcade games started to resemble

single-rider theme-park rides complete with rideable race horses, gyroscopically moving virtual simulators, and fighting booths that allowed players to battle virtual foes using actual punches and kicks. The most elaborate of these arcades was Virtual World's BattleTech Centers—steampunk-themed arcades with linked “battle pods”⁶ that allowed eight players to fight each other while stomping around in giant virtual “mechs.” But these elaborate arcade games required lots of floor space and were very expensive to maintain. In the late 1990s, home systems began to rival and eventually surpassed the graphics seen in most arcade games. Arcades went out of business by the dozens. The video games were replaced with more lucrative redemption machines⁷ and games of skill like skeeball, whack-a-mole, and basketball hoops. The golden age of video game arcades was over.

But you can't keep a good idea down. Since the late 90s arcades have become social and virtual experiences. **LAN gaming centers** combine retail and social space to allow players to play computer and console games on a per-hour basis. Many have upgraded to feature large-scale gaming experiences held in movie theater-sized venues. Internet cafes are similar to LAN centers but with an emphasis on cultivating a café-style environment. Meanwhile, the few arcade game manufacturers left are creating even more epic experiences—Namco's *Deadstorm Pirates* (2009) and *Dark Escape 4D* (2013) are more like theme-park dark rides⁸ than arcade games.

If arcades are becoming more like theme-park rides, theme parks are becoming arcades. Theme park creators are gamifying their attractions, turning dark rides into full sensory arcade games. Theme parks around the world such as Futuroscope and Warner Brother's Movie World offer several virtual games and interactive dark rides. For example, *Toy Story Midway Mania!* at Disney's California Adventure (2008) whisks a four-player cart past a succession of giant video screens where players compete in a variety of carnival-style shooting games. Players use cart-mounted pop-guns to shoot virtual projectiles at on-screen targets. When some targets are hit, players are sprayed with air or water mist effects, creating an immersive “four-D” effect. The cycle of modern arcade gaming and home gaming has come full circle with the release of a Wii version of the *Toy Story Midway Mania!* attraction for home use (minus the air and water effects).

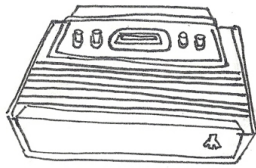
⁶ In the mid-1990s, I had the pleasure of going to a BattleTech Center on several occasions. The battle pods were a video gamer's dream come true. The player sat in a photo booth-sized cockpit. Dual control joysticks and foot pedals operated the mech's movement. Triggers and thumb switches fired the arsenal of weapons. Surrounding the pod's video monitor were banks of dipswitches—each one actually having a function within the game from activating tracking devices to venting overheating weapons. It took at least one gaming session (about a half hour) just to learn what all the switches did! It was as realistic a gaming experience as I've ever had.

⁷ Redemption machines are those claw catcher “games” you see in American toy stores and supermarkets. Personally, I would rather play the lottery than try my luck with one of these vending machines, which are rigged to (almost) guarantee you to lose. However, if you are ever in Japan, I recommend playing them as they are winnable and are usually stocked with some very cool toys and prizes.

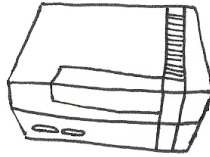
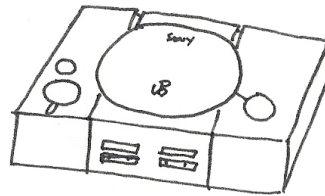
⁸ A “dark ride” is an indoor amusement park attraction where riders travel in vehicles past scenes containing animation, sound, music, and effects. Famous examples of dark rides include Disneyland's *Pirates of the Caribbean* and *Haunted Mansion* and Universal Studio's *Men in Black: Alien Attack* and *Revenge of the Mummy*.

Happily, historians and academics have realized the impact and importance of video gaming. Museums have sprung up around the world, such as the Computerspielemuseum Berlin and New York's Museum of the Moving Image. Retro 80s arcades are making a comeback, complete with glo-in-the-dark carpet and tokens, offering players another chance to play their favorite vintage arcade games and revisit their old-school home system favorites.

A **console** is a gaming platform that can be used in the home. A microprocessor runs the electronic device, which sends a video display signal to the user's TV set or monitor.⁹ Unlike the dedicated controllers of an arcade machine, a home console controller has enough buttons, triggers, and analog controls to allow for a variety of games to be played. And unlike the dedicated motherboards in early arcade games, which could hold only one game, console games use cartridge, CD, and DVD media to allow players to quickly change games. The first commercial home console was the Magnavox Odyssey (1972) created by gaming pioneer Ralph Baer. Technologically, the Odyssey was pretty far ahead of its time. It featured an analog controller, games on removable ROM cartridges, and a light gun—the first gaming peripheral. From the late 1970s onwards, there have been many home consoles. Some of the more popular and/or well-known previous generation ones include the Atari 2600 and Jaguar, the Mattel Intellivision, the ColecoVision, the Nintendo Entertainment System and Super Nintendo, the Sega Genesis and Dreamcast, the 3DO interactive player, PlayStation 3, Xbox 360, and the Nintendo Wii. Current consoles such as the PlayStation 4, Xbox One, Nintendo Wii U, and the Ouya continue to bring gaming into the homes of millions of gamers worldwide.



Atari 2600

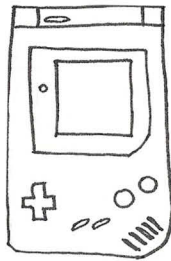
Nintendo Entertainment
System (NES)

PlayStation (PSX)

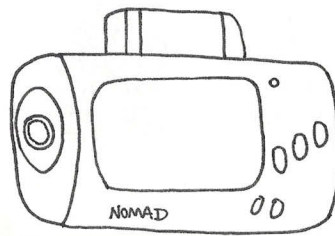
Like arcade games, **handheld games** have a visual display, a processor, and a controller, but are small enough to fit in the hands of the player. The first handheld titles were dedicated to only one game per unit. *Auto Race* (Mattel Electronics, 1976) used a digital display while the Game & Watch series (Nintendo, 1980) featured a more appealing liquid crystal display. Microvision (Milton Bradley, 1979) was one of the earliest handheld systems to have switchable cartridges.

⁹ One console exception is the wonderful Vectrex portable game system (Smith Engineering, 1982). The Vectrex's processor, screen, controller, and even one game were all in a self-contained, portable system.

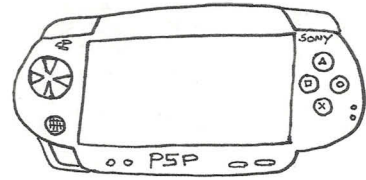
Handheld gaming took off when Tetris became a phenomenon on the Game Boy (Nintendo, 1989), the forerunner of the Nintendo DS.¹⁰ Recent handheld systems have become quite powerful. The processor on the Sony PlayStation Portable (PSP) can run the equivalent of a PlayStation 1 game. That's quite a jump since the digital blips of Mattel Football! Recent systems like the Sony Vita and Nintendo 2DS and 3DS offer a wide variety of games and control schemes, combining more traditional controls and games with second screens, touch controls, and digital content.



Nintendo Game Boy



Sega Nomad



PlayStation Portable (PSP)

The Brave New World of Gaming: Mobiles, Online Distribution, and Touchscreens

Handheld gaming, particularly on **mobile devices**, is the main way people play games today. With the advent of digital-only content, you can carry an entire gaming library around in your pocket on a smartphone or tablet. Gaming, which used to require a monitor, a computer, and a controller, can now be played anywhere and at any time. Touchscreens have enabled the creation of new control systems and genres of games.

Mobile gaming has changed not only the way we play games but also the way they are made. Games that used to require large teams and large budgets to create are now being made by small teams and even individuals. The games can be created quicker and for less money than their console and computer counterparts. Gameplay is built around short play sessions and repeated play. Sounds familiar, doesn't it? Mobile game production resembles the early days of game development, when games were the product of small teams or even one person. And even the way a game can earn money has changed. Monetized game design has changed the way revenue can be generated, giving the developer and publisher more opportunities to earn money. It is fair to say that mobile gaming has changed the way we game forever.

¹⁰ Not ironically, the Nintendo DS bears several design semblances to the original Game & Watch series devices.