

Game **DESIGN** Workshop

A PLAYCENTRIC APPROACH TO
CREATING INNOVATIVE GAMES



2ND
EDITION

by Tracy Fullerton

with a foreword by Eric Zimmerman



Chapter 2

The Structure of Games

Exercise 2.1: Think of a Game

1. Think of a game, any game. Now write down a description of the game. Be detailed. Describe it as if to someone who has never played a game like it before.
 2. Now think of another game—a completely different type of game. The more different this game is from the first one, the better. Describe it.
 3. Compare your descriptions. Which elements were different and which were similar? Dig deep and really think about the underlying mechanics of each game.
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There is no wrong answer to this exercise. The goal is simply to get you to begin thinking about the nature of games and to realize that games, no matter how dissimilar they might seem, do share some common elements. Those common elements are why we recognize certain experiences, and not others, as games, and throughout this book they will form the basis for our study of games and game design.

GO FISH VERSUS QUAKE

Do all games share the same exact structure? Of course not. A card game has a very different format than a board game; a 3D action game is not at all the same as a trivia game. There is something, however, that they must share because we clearly recognize them all as games. Take Go Fish and Quake. They must have some similarities because if we asked you if each was a game, you'd say, "Yes!" In other words, if these games don't share the same structure, then what do they share that makes them games and not two different forms of entertainment?

Before venturing to say what the similarities between them might be, it would help to look more closely at each of the two example games.

Go Fish

This is a game for three to six players using a standard 52-card deck. The dealer deals five cards to each player. The rest of the cards are placed face down in a draw pile. The player to the dealer's left starts.

A turn consists of asking a player for a specific rank. For example, if it's your turn, you might say, "Chris, please give me your jacks." You must already hold at least one card of the requested rank, so you must hold at least one jack to say this. If Chris has cards of the named rank (jacks in this case), he has to give you all his cards of this rank. You then get another turn and can again ask any player for any rank that you hold.

If Chris does not have any cards of the named rank, he says, "Go fish!" You must then draw the top card from the draw pile. If the drawn card is the rank you asked for, you show it and get another turn. If the drawn card is not the rank you asked for, you keep it, but the turn now passes to the player who said, "Go fish!"

As soon as a player collects a book of four cards of the same rank, this must be shown and discarded face down. The game continues until either someone has no cards left in their hand or the draw pile runs out. The winner is the player who then has the most books.

Quake

In single player Quake,¹ the player controls a character within a 3D environment. Your character can walk, run, jump, swim, shoot, and pick up stuff, but you have a limited amount of armor, health, and ammo.

In the game there are eight types of weapons: axe, shotgun, double-barreled shotgun, nail gun, perforator, grenade launcher, rocket launcher, and thunderbolt. Each weapon uses a specific type of ammo: Shells are for both types of shotguns, nails are for nail guns

and perforators, grenades are for grenade launchers and rocket launchers, and cells are for thunderbolts. There are also power-ups within the game that will boost your power, protect you, heal you, or render you invisible, invulnerable, or able to breathe underwater.

Your enemies include Rottweilers, grunts, enforcers, death knights, rotfish, zombies, scraggs, ogres, spawn, fiends, vores, and shamblers. Hazards you might find in the environment are explosions, water, slime, lava, traps, and teleporters. Your main enemy, codenamed Quake, is using "slip-gates" (transporter devices) to insert death squads inside your bases to kill, steal, and kidnap. There are four episodes in the game; the first level of each episode ends in a slip-gate—these signify that you've entered another dimension. When you complete an entire dimension (five to eight levels), you encounter another slip-gate that returns you to the start. The goal of Quake is to stay alive while you work your way through each level, killing all enemies in your way.

Comparison

At first glance, the descriptions of these two experiences could not be more dissimilar: One is a turn-based card game; the other is a real time 3D action shooter. One requires a piece of commercial software and a personal computer capable of running it; the other can be played with a common deck of cards. One is a copyrighted product; the other has a public domain set of rules that can be transferred verbally



2.1 Quake and Go Fish

from person to person, generation to generation. And yet we call them both games and agree, even if we cannot at first verbalize it, that they are similar experiences at some deep level.

If we look closely, though, and try not to ignore ideas that seem self-obvious, there are enough similarities between the experience of Quake and the experience of Go Fish for us to begin to understand what underlying requirements we are looking for when we judge whether or not something is a game.

Players

The most obvious similarity in these two descriptions is that both describe experiences designed for players. This sounds like a simple distinction, but what other forms of entertainment are designed to demand active participation by their consumers? Music is one example; musicians participate in creating the experience of music, but the primary consumers are the audience, not the players. Similarly, dramatic actors participate in the experience of a play, but again, the experience is primarily created for the audience.

In single player Quake, the design calls for a lone player working against the game system, while Go Fish requires a group of at least three players challenging each other. These are very different scenarios, but what the term “player” implies in each situation is the notion of a voluntary participant who both

partakes in and consumes the entertainment. Players are active, they make decisions, they are invested, they are potential winners—they are a very distinct subset of people. To become a player, one must voluntarily accept the rules and constraints of a game. This acceptance of a game’s rules is part of what author Bernard Suits has called the “lusory attitude” (“lusory” derives from the Latin word for game).

The lusory attitude of the players is the “curious state of affairs wherein one adopts rules which require one to employ worse rather than better means for reaching an end.”² For example, Suits describes the game of golf: “Suppose I make it my purpose to get a small round object into a hole in the ground as efficiently as possible. Placing it in the hole with my hand would be a natural means to adopt. But surely I would not take a stick with a piece of metal on one end of it, walk three or four hundred yards away from the hole, and then attempt to propel the ball into the hole with the stick.”³ But, of course, players do just this when they play golf because they have accepted the rules of golf as constraints on their attempts to achieve the objective of the game.

This attitude, this voluntary acceptance of the rules of a game, is part of the psychological and emotional state of players that we need to consider as part of the playcentric process of game design.



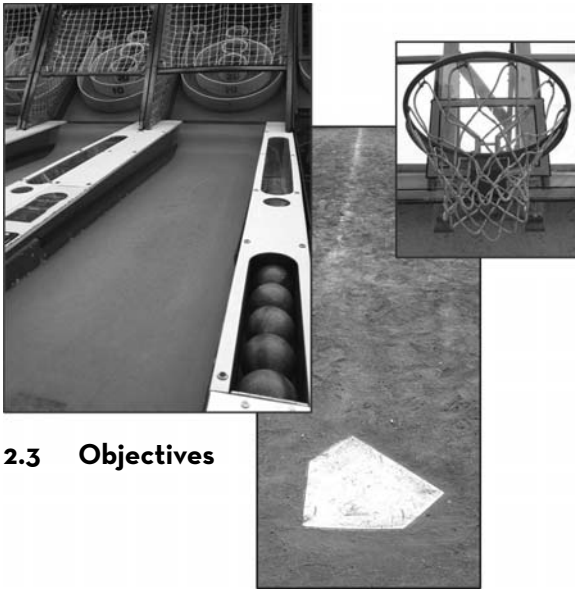
2.2 Players

Exercise 2.2: Players

Describe how players might join or start a game of Go Fish versus single player Quake. What steps do they need to take in each case—social, procedural, or technical? There will clearly be differences in beginning of a multiplayer card game versus a single player digital game, but are there also similarities? If so, describe them.

Objectives

The next clear distinction is that both descriptions lay out specific goals for the players. In Go Fish, the goal is to be the player who makes the most books. In Quake, it’s to stay alive and complete the level of the complex you are in.



2.3 Objectives

This is very different from other experiences in which we can participate in general. When you watch a film or read a book there is no clear-cut objective presented for you to accomplish during the experience—of course, there is one for the characters, but we’re talking about the players here. In life, we set our own objectives and work as hard as we feel necessary to achieve them. We don’t need to accomplish all of our objectives to have a successful life. In games, however, the objective is a key element without which the experience loses much of its structure, and our need to work toward the objective is a measure of our involvement in the game.

Exercise 2.3: Objectives

List five games, and in one sentence per game, describe the objective in each game.

Procedures

Both descriptions also give detailed instructions on what players can do to achieve the game objectives. For example, in Go Fish, some of these instructions include: “The dealer deals five cards to each player,” or “A turn consists of asking a specific player for a

specific rank.” In Quake, the description states that “Your character can walk, run, jump, swim, shoot, and pick up stuff.” The directions also provide a set of controls for doing so. These controls are the method by which the player accesses the basic procedures of the game. If we played Go Fish on a computer, we’d have to create controls for dealing or asking a player for a card of a certain rank.

Procedures, the actions or methods of play allowed by the rules, are an important distinction of the experiences we call games. They guide player behavior, creating interactions that would probably never take place outside the authority of the game.

For example, if you wanted to create a set of four cards of like rank, you wouldn’t necessarily ask one player at a time for these cards. You might use a more efficient means, like asking all of the players at once, or simply looking through the draw deck for the cards you need. Because games, by their nature, have procedures that must be followed, you don’t take these more efficient actions. Instead, you follow the procedures, and in doing so, you confirm that these required actions are indeed an important distinction that sets games apart from other behaviors and experiences.



2.4 Procedures

Rules

Both descriptions spend a great deal of time explaining exactly what objects the game consists of and what the players can and cannot do. They also clarify what happens in various situations that might arise. In *Go Fish*, “The cards are placed face down in a draw pile,” or “If Chris has cards of the named rank, he must give me all his cards of this rank.” And from *Quake*, “There are eight types of weapons,” and “Shells are for both types of shotguns, nails are for nail guns and perforators, etc.”

Some of these rule statements define game objects and concepts. Objects, like the deck of cards, draw pile, and weapons, are the building blocks of each of these systems upon which the rest of the design depends. Other rules limit player behavior and proscribe reactive events. For example, if nails are for nail guns, you can’t use nails in the thunderbolt. If you have a Jack when you’re asked for one, you have to give it up; you can’t keep it, or you’re breaking the rules of the game. Who will stop you from breaking the rules? Your own sense of fair play? The other players? The underlying code of a digital game?

The concepts of both rules and procedures imply authority, and yet there is no person or body named in either description with whom to associate that authority. The authority of the rules stems from an implicit

agreement by the players to submit themselves to the experience. If you don’t follow the rules, in a very real way, you are no longer playing the game.

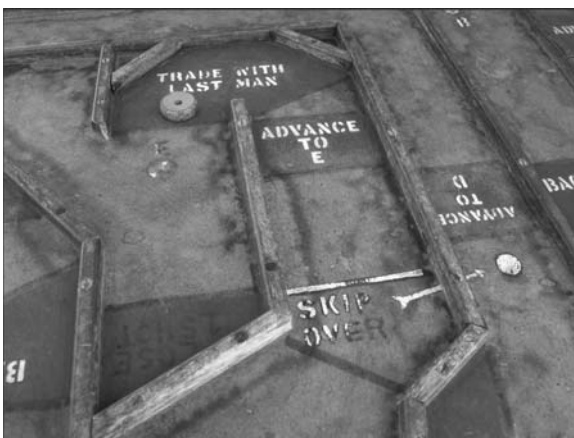
So our next distinctive quality of games is that they are experiences that have rules that define game objects, proscribe principles, and limit behavior within the game. These rules are respected because the players understand that they are a key structural element of the game, and without them, the game would not function.

Exercise 2.4: Rules

Can you think of a game that has no rules? If so, describe it. How about one rule? Why is this exercise difficult?

Resources

In the discussion of each of these games, we have mentioned certain objects that seem to hold a rather high value for the players in reaching their objectives. In *Go Fish*, the cards of each rank are valued, and in *Quake*, the weapons, their ammunition, and the power-ups mentioned in the rule set are valued. These objects, made valuable because they can help the players achieve their goal, but which are made scarce in the system by the designer, are what we call resources.



2.5 Rules



2.6 Resources

Finding and managing resources is a key part of many games, whether those resources are cards, weapons, time, units, turns, or terrain. In the two examples we see here, one depends on a direct exchange of resources (Go Fish), while the other offers resources fixed in place by the game designer (Quake).

Resources are, by definition, items made valuable by their scarcity and utility. In the real world, and in game worlds, resources can be used to further our aims; they can be combined to make new products or items; and they can be bought and sold in various types of markets.

Conflict

As noted previously, both experiences we described lay out specific objectives for their players. And, as we've also noted, they dictate procedures and rules that guide and limit player behavior. The problem for the players is that the procedures and rules of games tend to deter them from accomplishing goals directly; and, in the case of multiplayer games like Go Fish, can also make players work against each other to

accomplish these goals. For example, as mentioned earlier, you cannot simply ask everyone at the table to give you the other three Jacks all at once when you're playing Go Fish. You have to ask each player one at a time, risking that you might not get a card and lose your turn, while revealing to the other players that you have a card of the rank you asked for.

Similarly, in Quake, if you could just leave the level of the complex you're on, that would solve the objective, but it's not that easy. To find the exit, you're forced to make it through a mazelike obstacle course of enemies and hazards. In both cases, the relationship between the objectives of the players and the rules and procedures limiting and guiding behavior creates another distinctive element of games: conflict, which the players work to resolve in their own favor.

Exercise 2.5: Conflict

Compare and contrast the conflict in football to the conflict in poker. Describe how each game creates conflict for the players.



2.7 Conflict



Boundaries

Another similarity between these two experiences, one that is not referred to directly in either description but is, however, implied, is that the rules and goals that are driving the players apply only within the game and not in “real life.” In the case of *Quake*, the architecture of the 3D space forms a virtual boundary. Players are precluded from moving their characters out of these boundaries by the underlying code.

In the case of *Go Fish*, the boundaries are more conceptual than physical. Players are not precisely bound in a physical sense by any of the rules, except that they need to be able to speak to one another and trade cards back and forth. They are, however, conceptually bound by the social agreement that they are playing the game and that they will not leave the game with some of the cards or add extra cards to the deck.

In his foundational book *Homo Ludens*, theorist Johan Huizinga (see Further Reading) describes the physical and/or conceptual space in which a game takes place as the “magic circle,” a temporary world where the rules of the game apply, rather than the rules of the ordinary world. He writes: “All play moves and has its beginning within a playground marked off beforehand either materially or ideally . . . the arena, the card-table, the magic circle, the temple, the stage, the screen, the court of justice, etc. are all in form and



2.8 Boundaries

function playgrounds, i.e. forbidden spots, isolated, hedged round, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart.”⁴

The idea that these experiences are somehow set apart from other experiences by boundaries is yet another distinction we can make about the structure of games.

Outcome

One last similarity between both of these experiences is that for all their rules and constraints, the outcome of both experiences is uncertain, though there is the certainty of a measurable and unequal outcome of some kind—a winner, a loser, etc. For example, in *Go Fish*, the player who achieves the objective of making the most books by the end of the game wins. In *Quake*, a player can either win (stay alive) or lose (be killed).

The outcome of a game differs from the objective in that all players can achieve the objective, but other factors within the system can determine which of them actually win the game. For example, in *Go Fish*, a number of players can accomplish the objective of creating books, but only one player will create the most books, unless there’s a tie, and that type of special case is usually addressed in the rules of a game.

The aspect of uncertainty in outcome is an important one for our playcentric process because it is a key motivator for the players. If players can anticipate the outcome of a game, they will stop playing. You have probably been in this situation before—when one player is so far ahead that no one will be able to catch up. At this point, everyone generally agrees to end the game. In chess, a player who has calculated that she cannot win will often concede the game without playing it to the conclusion.

Unlike favorite movies or books, which can remain entertaining even if we already know the ending, games depend on uncertainty of outcome in every play for their dramatic tension. And players invest their emotions in that uncertainty, making it the job of the game designer to craft a satisfying resolution to the game, usually in the form of a measurable and unequal outcome.



2.9 Outcome

Formal Elements

The games you described in Exercise 2.1 might also have other elements we have not mentioned here: perhaps special equipment, digital environments, complex resources structures, or character definitions. And of course Go Fish and Quake each have their own unique elements that we haven't touched upon, such as the turn structure in Go Fish or the real-time element of Quake. But what we're interested in

right now are elements that all games share—elements that make up the essence of games.

A number of scholars from different fields have examined this same question from other perspectives. Some of the most influential have been those looking at games in terms of studying conflict, economics, behavioral psychology, sociology, and anthropology. Katie Salen and Eric Zimmerman do an excellent job of synthesizing these various points of view about the nature of games in their book *Rules of Play* (see Further Reading). But our perspective here is not strictly scholarly, and our purpose here is not to provide a definitive taxonomy. Rather, it is to provide a useful context, a set of conceptual tools, and a vocabulary for us to discuss the playcentric process of designing games.

The distinctive elements of games that are described above are important concepts for the game designer to understand because they provide structure (and form), which can help a beginning designer make choices in their design process and understand problems that arise in their playtesting process.

As with any art form, one of the reasons to understand and master the traditional structures is so that you can experiment with alternatives. (See sidebar on page 228 on the development of the experimental game Cloud.) The innovation we seek for the game industry very well might require going beyond these basic elements and exploring new forms of interactivity that lie at the edge of what we call “games.” Because they play an essential structural function in traditional game systems, however, we call these the “formal elements” of games. We will look at each of these formal elements in more detail in Chapter 3 and discuss how you can use them in various combinations to achieve your player experience goals.

ENGAGING THE PLAYER

If the formal elements mentioned provide structure to the experience of games, then what gives these elements meaning for the players? What makes one game capture the imagination of players and another fall flat? Certainly, some players are attracted to pure abstract challenges, but for most players, there needs to be something else that draws them in and allows

them to connect emotionally with the experience. Games are, after all, a form of entertainment, and good entertainment moves us both intellectually and emotionally.

This sense of engagement comes from different things for different players, and not all games require elaborate means to create it. Next we list some

elements that allow a player to make an emotional connection with a game.

Challenge

We said that experiences created conflict that the players had to work to resolve in their own favor. This conflict challenges the players, creating tension as they work to resolve problems, as well as creating varying levels of achievement or frustration. Increasing the challenge as the game goes on can cause a rising sense of tension, or if the challenge is too great, it can cause frustration. Alternately, if the challenge level remains flat or goes down, players might feel that they have mastered the game and move on. Balancing these emotional responses to the amount of challenge in a game is a key consideration for keeping the player engaged with the game.

Exercise 2.6: Challenge

Name three games that you find particularly challenging and describe why.

Play

The relationship between games and play is a deep and important one. To engage with a game system

is to play it, but play itself is not a game. Salen and Zimmerman define play as “free movement within a more rigid structure,” using the example of “free play” of a car’s steering wheel. “The ‘play’ is the amount of movement that the steering wheel can move on its own within the system, the amount the steering wheel can turn before it begins to turn the tires of the car. The play itself exists only because of the more utilitarian structures of the driving-system.”⁵ While this is a somewhat abstract definition, it is useful because it points out the way in which the more rigid systems of games can provide opportunities for players to use imagination, fantasy, inspiration, social skills, or other more free-form types of interaction to achieve objectives within the game space, to play within the game, as well as to engage the challenges it offers.

Play can be serious, like the pomp and circumstance surrounding a Grand Master match in chess, or it might be charged and aggressive, like the marathon play environment of a multiplayer Quake tournament. It might also be an outlet for fantasy, like the rich online environments of World of Warcraft and City of Heroes. Designing for the type of play that will appeal to your players, and also designing the freedom for a bit of free play within the more rigid game structures, are other key considerations for engaging players in your game.



2.10 Chess tournament and multiplayer Quake tournament

WHAT IS A PUZZLE?

by Scott Kim

Scott Kim has been a full-time puzzle designer since 1990 with his company, Shufflebrain. His work includes puzzles for Tetris, Bejeweled, and Collapse!, as well as game design for computer games Heaven & Earth and Obsidian. He also writes a monthly puzzle column for Discover magazine, and he has designed many games, including Sudoku 5x5, for the toy company ThinkFun. He has degrees in music and computers and graphic design from Stanford University, and he lectures widely on puzzle design and math education.

An earlier version of this article originally appeared in The Games Cafe, a now defunct Web site devoted to lovers of board games and puzzles.

From casual games to 3D action games, puzzles are an important part of many electronic games. Whether you are designing or producing games for the Web, mobile phones, computers, arcades, or console games, you need to know how to create good puzzles. In this article I define what a puzzle is, explain how it differs from other types of games, and offer suggestions for how to design good puzzles.

What Is a Puzzle?

The Random House Dictionary defines a puzzle as “a toy or other contrivance designed to amuse by presenting difficulties to be solved by ingenuity or patient effort.” A humorous but insightful definition is “a simple task with a bad user interface.” For example, twisting the faces of a Rubik’s Cube is a deliberately bad user interface for the simple task of turning all the faces solid colors.

My favorite definition of “puzzle” came out of a conversation with puzzle collector and longtime friend Stan Isaacs:

1. A puzzle is fun,
2. and it has a right answer.

Part 1 of the definition says that puzzles are a form of play. Part 2 distinguishes puzzles from other forms of plays, such as games and toys. This deceptively simple definition has some interesting consequences. For example, here’s the first puzzle I invented. (Martin Gardner first wrote about it in *Games* magazine.) The figure below is a letter of the alphabet that has been cut out of paper and folded just once. It is not the letter L. What letter is it?

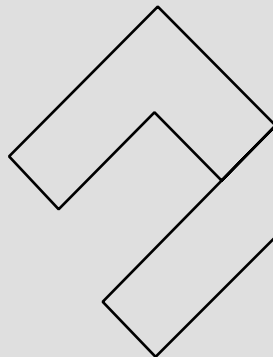


Figure 1 What letter has been folded once to make this shape?

Take a moment to solve this puzzle if you like. The answer is given at the end of this article. Now let's see how well our definition applies.

Is It Fun?

There are several things that help make this puzzle fun.

- *Novel*: Puzzles are a form of play. And play starts by suspending the rules of everyday life, giving us permission to do things that are not practical. Folded letters certainly don't have any practical value. They take something familiar and give it a novel twist—a good way of inviting you to be playful.
- *Not too easy, not too hard*: Puzzles that are too easy are disappointing; puzzles that are too hard are discouraging. You know there are only 26 letters in the alphabet, so it seems that this puzzle can't be too difficult. In fact this puzzle is hard enough that many people never get the answer. Nonetheless, the perceived lack of difficulty helps keeps you interested.
- *Tricky*: To solve this puzzle, you must change how you interpret the picture. Personally, I enjoy puzzles that involve such perceptual shifts.

But, like beauty, fun is in the eye of the beholder. What may be fun for one person may be torture for another. For example, some people prefer word puzzles and won't touch visual or logical puzzles. Puzzles that are too easy for one person might be too hard for another. Chess puzzles are fun only if you know how to play chess. Consequently, my first job as a puzzle designer is to tailor puzzles to the interests and abilities of my audience. For example, my monthly puzzles for *Discover* magazine all revolve around science and math themes. To reach both scientific lay people and experts, I break each puzzle into several questions, ranging from very easy to very hard. Finally, I include three puzzles in each column—usually a word puzzle, a visual puzzle, and a mathematical puzzle—to reach readers who prefer various types of puzzles.

Another consequence of the subjective nature of fun is that what might seem like an everyday problem to you can seem like a delightful puzzle to someone else. Is washing the dishes a chore or a game? That depends on whom you ask. It tickles me to think that for every problem in the world, no matter how tedious, there is someone who would leap at the chance to figure it out. If fun is a state of mind, then you can make your life more enjoyable by finding ways to turn work into play. When I was in school, I used to hate to take notes. Then I learned about mind mapping, a technique of capturing ideas in diagrams and cartoons instead of transcribing every word the teacher says. Not only were my notes more useful, taking notes became an enjoyable game of translating words into pictures. On the flip side, even the best game can be ruined if the players do not play it with a spirit of fun. Game designer and philosopher Bernie Dekoven recommends in his book *The Well Played Game* that players be willing to alter the rules to keep the game fun for everyone. For example, an expert chess player playing with a beginner can level the playing field by starting with fewer pieces or letting the other player take back moves.

Does It Have a Right Answer?

So does my letter puzzle have a right answer? It does in the sense that when shown the answer, most people will agree that this is the best answer. But there are several loopholes.

First, exactly what shape constitutes a letter is a subjective matter. For example, in a squarish typeface, the following shapes could be interpreted as a lowercase R or a capital J:



Figure 2 These shapes could be the letters R or J

I could plug this leak in my puzzle by showing the particular alphabet of letters I have in mind:

**ABCDEFGHIJKLM
NOPQRSTUVWXYZ**

Figure 3 The answer comes from this typeface

Another subtlety is that my definition doesn't insist that there be only one right answer. If you interpret the diagram differently, there are many other possible answers. For example, the following shapes, which could be interpreted as the letters J and G, can all be unfolded from Figure 1 if we interpret the edges a bit differently:

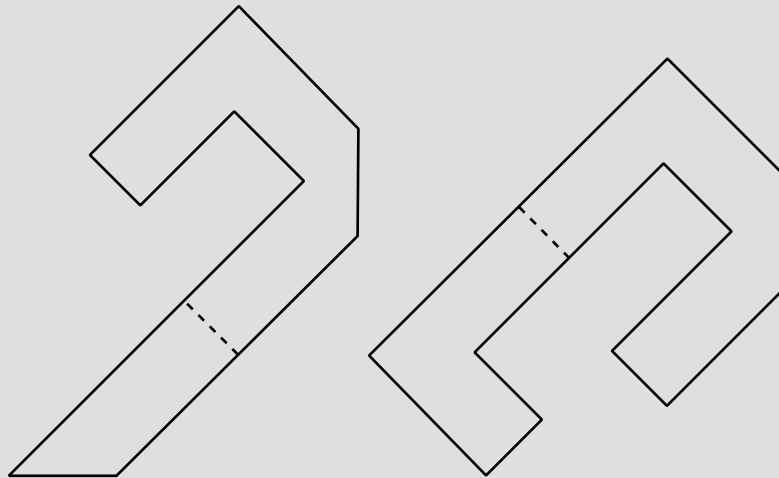


Figure 4 Other ways to unfold Figure 1

Puzzles versus Games

The purpose of “has a right answer” is to distinguish puzzles from games and other play activities. Some game designers categorize puzzles as a subspecies of games. I prefer a finer-grained definition from Chris Crawford, veteran game designer and author of *Chris Crawford on Game Design*.

Chris distinguishes four types of play activities, ranging from most to least interactive:

- Games are rule-based systems in which the goal is for one player to win. They involve “opposing players who acknowledge and respond to one another’s actions. The difference between games and puzzles has little to do with mechanics; we can easily turn many puzzles and athletic challenges into games and vice versa.”
- Puzzles are rule-based systems, like games, but the goal is to find a solution, not to beat an opponent. Unlike games, puzzles have little replay value.
- Toys are manipulable, like puzzles, but there is no fixed goal.
- Stories involve fantasy play, like toys, but they cannot be changed or manipulated by the player.

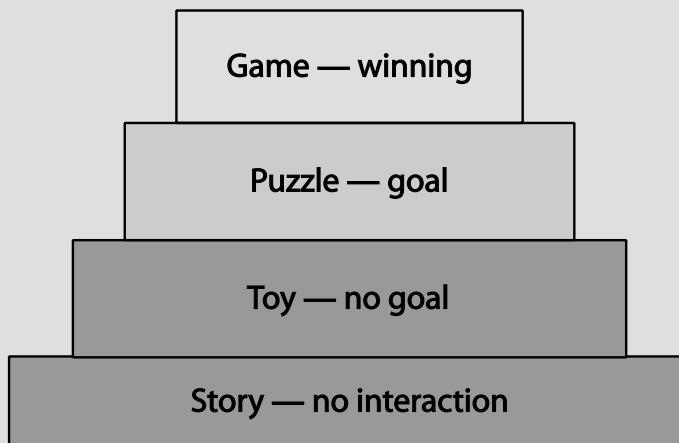


Figure 5 Four types of play, each built on the previous

For example, in the realm of computer entertainment software:

- Quake is a game that includes some puzzles.
- The Incredible Machine is a series of puzzles that includes a toylike construction set for building puzzles.
- SimCity is a toy that players make more puzzle-like by setting their own goals.
- Myst is a story that happens to be told partly through puzzles.

This hierarchy leads me to a useful rule of thumb for puzzle designers: To design a good puzzle, first build a good toy. The player should have fun just manipulating the puzzle, even before reaching a solution.

For example, players can enjoy rotating and manipulating blocks in the action puzzle game Tetris even if they don't understand the goal. The card game Solitaire is an interesting borderline case between game and puzzle. We normally call Solitaire a single player game, but in fact it is a kind of puzzle because any given deck has a definite solution (or sometimes no solution). Shuffling the cards is a way to randomly generate a new puzzle. Other types of puzzles that walk the line on the issue of right answers include trivia questions (which require knowledge of the world), dexterity puzzles (which could be classified with sports), puzzles involving chance (in which the player does not completely control their own fate), and poll-based questions (in which the rightness of an answer depends on what everyone else answers).

Designing Puzzles

Here are some tips for designing good puzzles.

First, there are two aspects of puzzle design. Level design, as it applies to puzzles, is crafting a particular puzzle configuration within a fixed set of rules. For example, composing a crossword puzzle is a form of level design. The level designer's challenge is to craft a puzzle with a distinct sense of drama and coherence that is tailored to a particular difficulty level.

The other type of puzzle design is rule design: inventing the overall rules, goal, and format of a puzzle. For example, Ernő Rubik was a rule designer when he invented Rubik's Cube. Note that some rule sets, like Sudoku, are reusable forms that yield thousands of puzzles, while other rule sets yield only a single unique puzzle. Generally speaking, rule design is harder than level design.

Second, puzzle design has the same goal as game design in general: to keep the player in a pleasurable challenging state of flow. That means capturing the player's interest with an attractive goal, teaching the player the rules in a seamless and interesting way, giving feedback during gameplay that keeps the player engaged, and rewarding the player appropriately at the end.

Finally, be creative. Don't limit yourself to imitating the puzzles you have seen. There is an infinite supply of puzzles waiting to be invented. Puzzles can be as varied and expressive as songs, movies, or stories. For inspiration, look beyond other computer games to puzzle books, mystery stories, physical puzzles, science, mathematics, and anything else that captures your imagination.

Exercise: Invent a Puzzle

Your challenge is to invent a computer-based puzzle inspired by a headline from today's newspaper. After you have invented the rules, craft at least two levels for your game: one easy and one hard. Remember that you are designing a puzzle, not an action game, so the puzzle must have a precisely defined solution.

Make a paper prototype of your puzzle and test it on other people. Be sure to explain what the goal of the puzzle is, what the rules are, and how the player controls the action. What do your testers enjoy? Where do they get stuck or confused? How can you change the puzzle or the rules to make the game better?

Answer to the Letter Puzzle

Just to make things more exciting, the answer to the quiz above is the only letter that does not appear in this sentence.

Premise

A basic way that games create engagement is with their overarching premise, which gives context to the formal elements. For example, the premise in Monopoly is that the players are each landlords, buying, selling, and developing valuable pieces of real estate in an effort to become the richest player in the game. This premise was quite appealing to down-and-out players during the Great Depression when the game was invented. It remains a favorite to this day, and one reason for that continued appeal is its premise—players enjoy the fantasy of being powerful, land-grabbing landlords with plenty of money to wheel and deal.

Many digital games have even more elaborate premises. Our earlier example of Quake, for instance, places the game play in an immersive environment, filled with violent, militaristic imagery. The premise of World of Warcraft is that players are characters



2.11 Monopoly

in a rich fantasy world filled with archetypal quests and adventures. The base-level effect of the premise is to make it easier for players to contextualize their choices, but it's also a powerful tool for involving players emotionally in the interaction of the formal elements.

Exercise 2.7: Premise

What are the premises for the games Risk, Clue, Pit, and Guitar Hero? If you don't know these games, pick games that you are more familiar with.

Character

Within the last 25 years, games have begun to address another potential tool for engagement, and that is the notion of character. In traditional storytelling, characters are the agents through which dramatic stories are told, and they can function this way in games as well, providing a way for us to empathize with the situation and live vicariously through their efforts. But characters in games can also be vessels for our own participation, entry points for us to experience situations and conflicts through the guise of a mask we create and direct. Character is a useful tool for dramatic engagement in games, and many games, especially digital games, have explored this area of potential.



2.12 The Evolution of Mario

Story

Lastly, some games engage players emotionally by using the power of story within or surrounding their formal elements. Story differs from premise in its narrative qualities. A premise need not go anywhere from where it begins, while stories unfold with the game. How story can be integrated into gameplay is an ongoing and fairly contentious debate. How much story is too much? How little is too little? Should gameplay change the story? Should story dictate the gameplay? There is no one answer to these questions, but it's clear from the interest of both players and designers that story integrated with play can create powerful emotional results.

Exercise 2.8: Story

Have any stories within a game ever gripped you, moved you emotionally, or sparked your imagination? If so, why? If not, why not?

Dramatic Elements

The games you picked in Exercise 2.1 on page 26 almost certainly have one or more of the elements described previously as a part of their design. We call these the “dramatic elements” of games because they engage the players emotionally by creating a dramatic context for the formal elements. In Chapter 4 on page 86 we'll look at each of these more closely and discuss how you can use dramatic elements to create meaningful game play experiences for your players.



2.13 Final Fantasy VIII—dramatic story elements

THE SUM OF THE PARTS

One thing that might not be immediately apparent from your game descriptions or from our examples of Go Fish and single player Quake is the depth to which each of the elements we've discussed relies on the others. This is because games are systems, and systems, by definition, are groups of interrelated elements that work together to form a complex whole.

An important idea to consider when thinking about games as systems is the old saying that the whole is greater than the sum of its parts. What we mean by this is that a system, because of the interrelationship of its elements, takes on new dimensions when it is set in motion. As an example, think of a system you are familiar with, such as the engine in your car. You can examine and understand the physical makeup of each element in the engine. You can understand their functions and even predict how

they will respond in interaction with other elements. But unless you set the system in motion, you cannot observe certain important qualities of the engine as a whole—namely, its primary function of producing motive power. When the system is started, however, these qualities emerge as a consequence of the interaction of all the elements.

Game systems are much the same. All of the elements we have laid out previously form a potential that remains nascent until the game is played. What emerges in play is something that cannot be predicted from examining each of the elements separately. The game designer needs to be able to look at a game system not only as separate elements but also as a whole in play. Chapter 5 will look at games as dynamic systems and describe a number of key concepts for working with the system elements in your own games.

DEFINING GAMES

Now that we've thought about some of the various aspects of games, it seems natural to try to pull it all together and answer the question we posed at the beginning of this chapter: What is a game? What makes Go Fish, or Quake, or any other game that you can play, a game and not some other type of experience?

We have said that games are given structure by their formal elements, that they also have dramatic elements that make them emotionally engaging experiences. We have also said that games are dynamic systems and that their elements work together to produce a complex whole. We can go even further in our definition by pulling out some of the most important elements from the earlier discussion.

When we talked about boundaries, we mentioned the physical and the conceptual because this is what most games deal with in their rules. What we did not mention is the emotional boundary between the rest of life and a game. When you play a game, you set the rules of life aside and take up the rules of the game instead. Conversely, when you finish playing a game, you set aside the incidents and outcome of that game and return to the trappings of the outside

world. Within the game, you might have slaughtered your best friend, or she might have slaughtered you. But that was within the game. Outside the game, these actions have no real consequences. What we are describing is the fact that game systems are separate from the rest of the world; they are closed.

We said that games are formal systems—that they are defined as games, and not some other type of interaction, by their formal elements. Also, we know that it is key to our definition of games to show that these elements are interrelated, and we should include the concept that a game is a system. So the first statement we can make confidently about games is that they are closed, formal systems.

We have talked at length about the fact that games are for players, that the entire purpose of games is to engage players. Without players, games have no reason to exist. How do games engage players? By involving them in a conflict that is structured by their formal and dramatic elements. Games challenge players to accomplish their objectives while following rules and procedures that make it difficult to do so. In single player games, this challenge can come from the system

itself, while in multiplayer games it can come from the system, from other players, or from both. So the second statement we can add to our definition of games is that they engage players in structured conflicts.

Lastly, games resolve their uncertainty in unequal outcomes. A fundamental part of gameplay is that it is uncertain. However, it promises to end that uncertainty by producing a winner or winners. Games are not experiences designed to prove we are all equal. In fairness to the great breadth of game systems, some games are not exacting in their sense of closure or in the measure of their outcome. However, even

if you are playing a game like World of Warcraft that goes on and on ad infinitum, or a game like The Sims, which has no specified objective, these games find ways to provide both moments of resolution and measurable achievement to their players.

Drawing these concepts together, we can come to this working conclusion about the nature of games. A game is:

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

BEYOND DEFINITIONS

Now that we have created a definition, the first thing we want to do is look beyond it. There is a realm of possibilities for game designers that exists on the edges of what we consider to be games. We have already mentioned online environments such as World of Warcraft and simulations such as The Sims, but there are also “serious games,” such as Darfur is Dying, a game about the genocide in Darfur, or September 12th, a simulation about the futility of direct militaristic response to terrorism, that take on serious themes and use some of the formal and dramatic elements of games to engage players with those themes. Some people would not call these games, but it is possible that these, and other experimental game designs, will point the way to new forms of play and interactivity.



2.14 Darfur is Dying

Exercise 2.9: Applying What You Have Learned

For this exercise, you will need a piece of paper, two pens, and two players. First, take a moment to play this simple game:⁶

1. Draw three dots randomly on the paper. Choose a player to go first.
2. The first player draws a line from one dot to another dot.
3. Then that player draws a new dot anywhere on that line.
4. The second player also draws a line and a dot:
 - The new line must go from one dot to another, but no dot can have more than three lines coming out of it.
 - Also, the new line cannot cross any other line.
 - The new dot must be placed on the new line.
 - A line can go from a dot back to the same dot as long as it doesn't break the “no more than three lines” rule.
5. The players take turns until one player cannot make a move. The last player to move is the winner.

Identify the formal elements of this game:

- *Players*: How many? Any requirements? Special knowledge, roles, etc.?
- *Objective*: What is the objective of the game?

- *Procedures*: What are the required actions for play?
- *Rules*: Any limits on player actions? Rules regarding behavior? What are they?
- *Conflict*: What causes conflict in this game?
- *Boundaries*: What are the boundaries of the game? Are they physical? Conceptual?
- *Outcome*: What are the potential outcomes of the game?

Does the game have dramatic elements? Identify them:

- *Challenge*: What creates challenge in the game?
- *Play*: Is there a sense of play within the rules of the game?
- *Premise/Character/Story*: Are these present?

What types of dramatic elements do you think might add to the game experience?

CONCLUSION

Notice that although we have arrived at a working definition, we have come to no grand conclusion on the absolute nature of games. In fact, we have said that part of our hope is that the next generation of game designers will look beyond the traditional definition of games and explore new territories. The areas of structure we have mapped out are important to the process of design, and as such they need to be clear. The areas left in shadow are just as interesting, and we encourage you to think about aspects of games that interest and inspire you.

Our goal in this taxonomy exercise is to provide a starting point. It is not meant to constrict you as a designer. Having said that, terminology is key. The lack of a single vocabulary is one of the

largest problems facing the game industry today. The terms we have suggested here are just that—suggestions. We use them consistently throughout this book so that we can have a common language with you with which to discuss the design process and to help you evaluate and critique your designs.

After you have gained experience with this process, it is up to you as a designer to move beyond any limitations you find with it. Consider everything you read here a starting point from which you can jump off—a launch pad for your expedition into the world of designing games that will hopefully push the envelope and transport players to places they didn't imagine possible.