The Dimensions of a Game World

Many different properties define a game’s world. Some, such as the size of the world, are quantitative and can be given numerical values. Others, such as the world’s mood, are qualitative and can only be described with words. Certain properties are related to one another, and these groups of related properties are the **dimensions** of the game world. To fully define your world and its setting, you need to consider each of these dimensions and answer certain questions about them.

**The Physical Dimension**

Video game worlds are almost always implemented as some sort of simulated physical space. The player moves his avatar in and around this space or manipulates other pieces or characters in it. The physical properties of this space determine a great deal about the gameplay.

The physical dimension of a game is itself characterized by several different properties: spatial dimensionality, scale, and boundaries.

**Spatial Dimensionality**

One of the first questions to ask yourself is how many spatial dimensions your physical space will have. It is essential to understand that the dimensionality of the game’s physical space is not the same as how the game *displays* that space (the camera model) or how it implements the space in the software. How to implement the space and how to display it are separate but related questions. The former has to do with technical design, and the latter has to do with user interface design. Ultimately, all spaces must be displayed on the two-dimensional surface of the monitor screen.

These are the typical dimensionalities found in video games:

When you first think about the dimensionality of your game space, don’t immediately assume that you want it to be three-dimensional because 3D seems more real or makes the best use of your machine’s hardware. As with everything else you design, the dimensionality of your physical space must serve the entertainment value of the game. Make sure all the dimensions will contribute meaningfully. Many games that work extremely well in two dimensions don’t work well in three. *Lemmings* was a hit 2D game, but *Lemmings 3D* was nowhere near as successful because it was much more difficult to play. The addition of a third dimension detracted from the player’s enjoyment rather than added to it.

3D games with a two-dimensional playing field

*Smashbros, mortal kombat, marvel vs capcom*
Scale

Scale refers to both the absolute size of the physical space represented, as measured in units meaningful in the game world (meters, miles, or light-years, for instance) and the relative sizes of objects in the game.

Boundaries

In board games, the edge of the board is the edge of the game world. Because computers don’t have infinite memories, the physical dimension of a computer game world must have an “edge” as well. However, computer games are usually more immersive than board games, and they often try to disguise or explain away the fact that the world is limited to help maintain the player’s immersion.

In some cases, the boundaries of a game world arise naturally, and we don’t have to disguise or explain them. Sports games take place only in a stadium or an arena, and no one expects or wants them to include the larger world. In most driving games, the car is restricted to a track or a road, and this, too, is reasonable enough.

Finally, you can solve the problem of boundaries by requiring the player to move among defined locations. For example, you might let a player fly from planet to planet in the solar system by clicking on the planet she wants to go to. The player cannot go beyond the boundary of the solar system because there are no planets in interstellar space. The user interface for movement creates a natural limit that requires no further explanation.

The Temporal Dimension

The temporal dimension of a game world defines the way that time is treated in that world and the ways in which it differs from time in the real world.

Variable Time

In games that do implement time as a significant element of the gameplay, time in the game world usually runs much faster than in reality. Time in games also jumps (as it does in books and movies), skipping periods when nothing interesting is happening. Most war games, for example, don’t bother to implement nighttime or require that soldiers get any rest. In reality,
soldier fatigue is a critical consideration in warfare, but because sleeping soldiers don’t make exciting viewing and certainly aren’t very interactive, most games just skip sleep periods. Allowing soldiers to fight continuously without a pause permits the player to play continuously without a pause also.

_The Sims_, a game about managing a household, handles this problem a different way. The simulated characters require rest and sleep for their health, so _The Sims_ depicts day and night accurately. However, when all the characters go to sleep, the game speeds up considerably, letting hours go by in a few seconds. As soon as anyone wakes up, time slows down again.

_The Sims_ is a rather unusual game in that it’s chiefly about time management. The player is under constant pressure to have his characters accomplish all their chores and get time for sleep, relaxation, and personal development as well. The game runs something like 48 times as fast as real life, so it takes about 20 minutes of real time to play through the 16 hours of game-world daytime. However, the characters don’t move 48 times as fast. Their actions look pretty normal, about as they would in real time. As a result, it takes them 15 minutes according to the game’s clock just to go out and pick up the newspaper. This contributes to the sense of time pressure. Because the characters do everything slowly (in game terms), they often don’t get a chance to water their flowers, which consequently die.

**Anomalous Time** a·nom·a·lous

Deviating from what is standard, normal, or expected.

In _The Settlers: Rise of an Empire_, a complex economic simulation, a tree can grow from a sapling to full size in about the same length of time that it takes for an iron foundry to smelt four or five bars of iron. This is a good example of anomalous time: time that seems to move at different speeds in different parts of the game. Blue Byte, the developer of _The Settlers_, tuned the length of time it takes to do each of the many tasks in the game to make sure that the game as a whole would run smoothly. As a result, _The Settlers_ is very well balanced at some cost to realism. However, it doesn’t disrupt the fantasy because _The Settlers_ doesn’t actually give the player a clock in the game world. There’s no way to compare game time to real time, so in effect, the game world has no obvious time scale (see **Figure 4.7**).

**Figure 4.7. Activities in The Settlers: Rise of an Empire take anomalous lengths of time, but the user interface does not include a clock.**

[View full size image]
Another example of anomalous time appears in *Age of Empires*, in which tasks that should take less than a day in real time (gathering berries from a bush, for example) seem to take years in game time according to the game clock. *Age of Empires* does have a time scale, visible on the game clock, but not everything in the world makes sense on that time scale. The players simply have to accept these actions as symbolic rather than real. As designers, we have to make them work in the context of the game world without disrupting the fantasy. As long as the symbolic actions (gathering berries or growing trees) don’t have to be coordinated with real-time actions (warfare) but remain essentially independent processes, it doesn’t matter if they operate on an anomalous time scale.

**Letting the Player Adjust Time**

Flight simulators also usually run in real time, but there are often long periods of flying straight and level during which nothing of interest is going on; the plane is simply traveling from one place to another. To shorten these periods, many games offer a way to speed up time in the game world by two, four, or eight times—in effect, make everything in the game world go faster than real time. When the plane approaches its destination, the player can return the game to normal speed and play in real time.

**The Environmental Dimension**

The environmental dimension describes the world’s appearance and its atmosphere. The environmental characteristics of the game world form the basis for creating its art and audio. We’ll look at two particular properties: the cultural context of the world and the physical surroundings.

**Cultural Context**

The cultural context of a game refers to its culture in the anthropological sense: the beliefs, attitudes, and values that the people in the game world hold, as well as their political and religious institutions, social organization, and so on—in short, the way those people live.

Culturally relevant?

The cultural context also includes the game’s backstory. The backstory of a game is the imaginary history, either large-scale (nations, wars, natural disasters) or small-scale (personal events and interactions), that preceded the time when the game takes place.
Physical Surroundings

The physical surroundings define what the game actually looks like. This is a part of game design in which it’s most helpful to be an artist or to work closely with one. In the early stages of design, you don’t need to make drawings of every single thing that can appear in the game world (although sooner or later someone will have to do just that). For the time being, it’s important to create concept sketches: pencil or pen-and-ink drawings of key visual elements in the game. Depending on what your game is about, this can include buildings, vehicles, clothing, weaponry, furniture, decorations, works of art, jewelry, religious or magical items, logos or emblems, and on and on.

Detail

Every designer must decide how much detail the game world needs—that is to say, how richly textured the world will be and how accurately modeled its characteristics will be. To some extent, your answer will be determined by the level of realism that you want, but technical limitations and time constraints will necessarily restrict your ambitions. No football game goes to the extent of modeling each fan in the stadium, and few flight simulators model all the physical characteristics of their aircraft.

Defining a Style

In describing how your world is going to look, you are defining a visual style for your game that will influence a great many other things as well: the character design, the user interface, perhaps the manual, and even the design of the box and the advertising. You actually have two tasks to take on here: defining the style of things in your world (that is, its intrinsic style), and also defining the style of the artwork that will depict your world. They aren’t the same. For example, you can describe a world whose architectural style is inspired by Buddhist temples but draw it to look like a film noir movie. Or you could have medieval towns with half-timbered houses but depict them in a slightly fuzzy, Impressionistic style. You must choose both your content and the way in which you will present that content.

Overused Settings

All too often, games borrow settings from one another or from common settings found in the movies, books, or television. A huge number of games are set in science fiction and fantasy worlds, especially the quasi-medieval, sword-and-sorcery fantasy inspired by J. R. R. Tolkien and Dungeons & Dragons, popular with the young people who used to be the primary—indeed, almost the only—market for computer games. But a more diverse audience plays games
nowadays, and they want new worlds to play in. You should look beyond these hoary old staples of gaming. As Chapter 3 mentioned, Interstate ‘76 is inspired by 1970s TV shows. It includes cars, clothing, music, and language from that era, all highly distinctive and evocative of a particular culture. Interstate ‘76 has great gameplay, but what really sets it apart from its competitors is that it looks and sounds like nothing else on the market.

Sources of Inspiration

Art and architecture, history and anthropology, literature and religion, clothing fashions, and product design are all great sources of cultural material. Artistic and architectural movements, in particular, offer tremendous riches: Art Nouveau, Art Deco, Palladian, Brutalism. If you haven’t heard of one of these, go look it up now. Browse the web or the art, architecture, and design sections of the bookstore or the public library for pictures of interesting objects, buildings, and clothing. Carry a digital camera around and take pictures of things that attract your eye, then post the pictures around your workspace to inspire yourself and your coworkers. Collect graphic scrap from anywhere that you find it. Try old copies of National Geographic. Visit museums of art, design, and natural history if you can get to them; one of the greatest resources of all is travel, if you can afford it. A good game designer is always on the lookout for new ideas, even when he’s ostensibly on vacation.

The Emotional Dimension

The emotional dimension of a game world defines not only the emotions of the people in the world but, more important, the emotions that you, as a designer, hope to arouse in the player. Multiplayer games evoke the widest variety of emotions, because the players are socializing with real people and making friends (and, alas, enemies) as they play. Single-player games have to influence players’ emotions with storytelling and gameplay. Action and strategy games are usually limited to a narrow emotional dimension, but other games that rely more heavily on story and characters can offer rich emotional content that deeply affects the player.

Influencing the Player’s Feelings

Games are intrinsically good at evoking feelings related to the player’s efforts to achieve something. They can create “the thrill of victory and the agony of defeat,” as the old ABC Wide World of Sports introduction used to say. Use the elements of risk and reward—a price for failure and a prize for success—to further heighten these emotions. Games can also produce frustration as a by-product of their challenges, but this isn’t a good thing; some players tolerate frustration poorly and stop playing if it gets too high. To reduce frustration, build games with player-settable difficulty levels and make sure the easy level is genuinely easy. Excitement and anticipation, too, play large roles in many games. If you can devise a close contest or a series of stimulating challenges, you will generate these kinds of emotions.
Construction and management simulations, whose challenges are usually financial, arouse the player’s feelings of ambition, greed, and desire for power or control. They also offer the emotional rewards of creative play. Give the player a way to amass a fortune, then let her spend it to build things of her own design. The *SimCity* and various *Tycoon* games (*RollerCoaster Tycoon, Railroad Tycoon*, and so on), do this well. Artificial life games and god games such as *Spore* or *The Sims* let the player control the lives of autonomous people and creatures for better or worse, satisfying a desire to be omnipotent over a world of beings subject to the player’s will. (This may not be a very admirable fantasy, but it’s one that a lot of people enjoy having fulfilled.)

To create suspense, surprise, and fear, use the time-honored techniques of horror films: darkness, sudden noises, disgusting imagery, and things that jump out at the player unexpectedly. Don’t overdo it, however. A gore-fest becomes tedious after a while, and Alfred Hitchcock demonstrated that the shock is all the greater when it occurs infrequently. For suspense to work well, the player needs to feel vulnerable and unprepared. Don’t arm him too heavily; the world’s a lot less scary when you’re carrying a rocket launcher around. *Survival horror* is a popular subgenre of action game, as seen in the *Silent Hill* and *Resident Evil* series, that uses these approaches.

Another class of emotions is produced by interactions between characters and the player’s identification with one of them. Love, grief, shame, jealousy, and outrage are all emotions that can result from such interactions. (See Figure 4.13 for a famous example.) To evoke them, you’ll have to use storytelling techniques, creating characters that the player cares about and believes in and credible relationships between them. Once you get the player to identify with someone, threaten that character or place obstacles in his path in a way that holds the player’s interest. This is the essence of dramatic tension, whether you’re watching Greek tragedy or reading *Harry Potter*. Something important must be at stake. The problem need not necessarily be physical danger; it can also be a social, emotional, or economic risk. The young women in Jane Austen’s novels were not in imminent peril of death or starvation, but it was essential to their family’s social standing and financial future for them to make good marriages. The conflict between their personal desires and their family obligations provides the tension in the novels.

A good many games set the danger at hyperbolic levels with extreme claims such as “The fate of the universe rests in your hands!” This kind of hyperbole appeals to young people, who often feel powerless and have fantasies about being powerful. To adults, it just sounds a bit silly. At the end of *Casablanca*, Rick said, “The problems of three little people don’t amount to a hill of beans in this crazy world,” but he was wrong. The whole movie, a movie still popular over a half century after its first release, is about the problems of those three little people. For the
duration of the film, these problems hold us entranced. It isn’t necessary for the fate of the world to be at stake; it is the fates of Rick, Ilsa, and Victor that tug at our hearts.

The Limitations of Fun

*Weaver’s Law: The quality of an entertainment is inversely proportional to the awareness of time engaged in it.*

—CHRIS WEAVER, FOUNDER OF BETHESDA SOFTWORKS

Most people think that the purpose of playing games is to have fun, but *fun* is a rather limiting term. It tends to suggest excitement and pleasure, either a physical pleasure such as riding a roller coaster, a social pleasure such as joking around with friends, or an intellectual pleasure such as playing cards or a board game. The problem with striving for fun is that it tends to limit the emotional range of games. Suspense, excitement, exhilaration, surprise, and various forms of pleasure fall within the definition of fun, but not pity, jealousy, anger, sorrow, guilt, outrage, or despair.

You Can’t Paint Emotion by Numbers

The idea that games should include more emotional content and should inspire more emotions in players has been gaining ground in the game industry for several years. Unfortunately, this has produced a tendency to look for quick and easy ways to do it, mostly by relying on clichés. The young man whose family is killed and who is obsessed by his desire for revenge or the beautiful princess who needs to be rescued both belong more to fairy tales than to modern fiction. That may be all right if your game aspires to nothing more, but it won’t do if you’re trying to create an experience with any subtlety. Contrast, for example, the simple themes of the early animation films and the more psychologically rich stories in the recent Pixar films.

Beware of books or articles that offer simple formulas for emotional manipulation: “If you want to make the player feel X, just do Y to the protagonist.” An imaginative and novel approach to influencing the players’ feelings requires the talents of a skilled storyteller. Paint-by-numbers emotional content has all the sensitivity and nuance of paint-by-numbers art.

The Ethical Dimension

The ethical dimension of a game world defines what right and wrong mean within the context of that world. At first glance, this might seem kind of silly—it’s only a game, so there’s no need to talk about ethics. But most games that have a setting, a fantasy component, also have an ethical system that defines how the player is supposed to behave. As a designer, you are the god of the game’s world, and you establish its morality. When you tell a player that he must perform certain actions to win the game, you are defining those actions as good or desirable.
Likewise, when you say that the player must avoid certain actions, you are defining them as bad or undesirable. The players who come into the world must adopt your standards or they will lose the game.

In some respects, the morality of a game world is part of its culture and history, which are part of the environmental dimension, but because the ethical dimension poses special design problems, it needs a separate discussion. The ethics of most game worlds deviate somewhat from those of the real world—sometimes they’re entirely reversed. Games allow, even require, you to do things that you can’t do in the real world. The range of actions that the game world permits is typically narrower than in the real world (you can fly your F-15 fighter jet all you want, but you can’t get out of the plane), but often the permitted actions are quite extreme: killing people, stealing things, and so on.

Moral Decision-Making

On the whole, most games have simple ethics: clobber the bad guys, protect the good guys. It’s not subtle but it’s perfectly functional; that’s how you play checkers. Not many games explore the ethical dimension in any depth. A few include explicit moral choices, but unfortunately, these tend to be namby-pamby, consistently rewarding good behavior and punishing bad behavior. Such preachy material turns off even children, not to mention adults. But you can build a richer, more involving game by giving the player tough moral choices to make. Ethical ambiguity and difficult decisions are at the heart of many great stories and, indeed, much of life. Should you send a platoon of soldiers to certain death to save a battalion of others? How would you feel if you were in the platoon?

In many role-playing games, you can choose to play as an evil character who steals and kills indiscriminately, but other characters will refuse to cooperate with you and might even attack you on sight. It’s easier to get money by robbing others than by working for it, but you may pay a price for that behavior in other ways. Rather than impose a rule that says, “Immoral behavior is forbidden,” the game implements a rule that says, “You are free to make your own moral choices, but be prepared to live with the consequences.” This is a more adult approach to the issue than simply punishing bad behavior.

The ethical dimension of multiplayer games, whether online or local, is an enormous and separate problem. Chapter 21, “Online Games,” discusses this issue at length.

The Peculiar Morality of America’s Army

America’s Army, a team-based multiplayer first-person shooter (FPS) game distributed free by the U.S. Army, is intended to serve as an education and recruiting
tool, teaching players how real soldiers are supposed to fight (Figure 4.14). It differs from most FPS games in two significant ways. First, it requires that the player act in conformance with the actual disciplinary requirements of the Army, so it detects and punishes dishonorable behavior. The Army is anxious to make the point that soldiering comes with serious moral responsibilities. Second, and rather strangely, all sides in a firefight see themselves as U.S. soldiers, and they see the enemy as rather generic terrorists. The Army did not want to give any player the chance to shoot at American soldiers, even though they are obviously shooting at one another. So a player sees himself and his teammates as U.S. soldiers carrying M-16 rifles, but his opponents see him and his teammates as terrorists carrying AK-47s. In other words, everyone perceives himself as a good guy and his opponent as a bad guy, and the game’s graphics literally present two different versions of reality to each team. By avoiding a politically unacceptable design (letting players shoot at American soldiers in a game made by the U.S. Army), they created a moral equivalence: The question of who is in the right is purely a matter of perspective. America’s Army’s trick of displaying different versions of the game world to different players may be unique among video games.

Figure 4.14. Our guys get the drop on somebody who also thinks he’s one of our guys.

A Word about Game Violence

It’s not part of this book’s mission to debate, much less offer an answer for, the problem of whether violent video games cause violent behavior in children or adults. This is a psychological question that only prolonged and careful study can resolve. Unfortunately, a good many people on both sides of the issue seem to have made up their minds already, and arguments continue to rage in government and the media, supported for the most part by very few facts.

For you, as a designer, however, consider these suggestions. The essence of many games is conflict, and conflict is often represented as violence in varying degrees of realism. Chess is a war game in which pieces are killed—removed from the board—but nobody objects to the violence of chess; it’s entirely abstract. American football is a violent contact sport in which real
people get injured all the time, but there are no serious efforts to ban football, either. The only way to remove violence from gameplay is to prohibit most of the games in the world because most contain violence in some more-or-less abstract form. The issue is not violence, per se, but how violence is portrayed and the circumstances under which violence is acceptable.

Games get into political trouble when they have a close visual similarity to the real world but an ethical dimension that is strongly divergent from the real world. The game *Kingpin* encourages the player to beat prostitutes to death with a crowbar, with bloodily realistic graphics. Not surprisingly, it has earned a lot of criticism. On the other hand, *Space Invaders* involves shooting hundreds of aliens, but it is so visually abstract that nobody minds. In other words, the more a game resembles reality visually, the more its ethical dimension should resemble reality as well, or it’s likely to make people upset. If you want to make a game in which you encourage the player to shoot anything that moves, you’re most likely to stay out of trouble if those targets are nonhuman and just quietly disappear rather than break apart into bloody chunks. Tie your ethical realism to your visual realism.

Computer games are about bringing fantasies to life, enabling people to do things in make-believe that they couldn’t possibly do in the real world. But make-believe is a dangerous game when it’s played by people for whom the line between fantasy and reality is not clear. Young children (those under about age eight) don’t know much about the real world; they don’t know what is possible and what isn’t, what is fantasy and what is reality. An important part of raising children is teaching them this difference. But until they’ve learned it, it’s best to make sure that any violence in young children’s games is suitably proportionate to their age. The problem with showing violence to children is not the violence, per se, but the notion that there’s no price to pay for it. For a detailed and insightful discussion of how children come to terms with violence, read *Killing Monsters: Why Children Need Fantasy, Super Heroes, and Make-Believe Violence* by Gerard Jones (Jones, 2002). Ultimately, the violence in a game should serve the gameplay. If it doesn’t, then it’s gratuitous and you should consider doing without it.

Realism

All games, no matter how realistic, require some abstraction and simplification of the real world. Even the multimillion-dollar flight simulators used for training commercial pilots are incapable of turning the cockpit completely upside down.

layers and game reviewers often talk about realism as a quality of an entire game, but in fact, the level of realism differs in individual components of the game. Many games have highly realistic graphics but unrealistic physics. A good many first-person shooters accurately model the performance characteristics of a variety of weapons—their rate of fire, size of ammunition
clips, accuracy, and so on—but allow the player to carry about 10 of them at once with no reduction in speed or mobility. Therefore, realism is not a single dimension of a game world, but a multivariate quality that applies to all parts of the game and everything in it.

If you’re mathematically inclined, think of realism as a vector over every aspect of the game, with values ranging from 0, entirely abstract, to 1, entirely realistic. However, no value ever equals 1 because nothing about a game is ever entirely realistic—if it were, it would be life, not a game.

Summary

At this point, you should know when and where your game takes place. You will have answered a huge number of questions about what your world looks like, what it sounds like, who lives there, and how they behave. If you’ve done it thoroughly, your game world will be one in which a player can immerse himself, a consistent fantasy that he can believe in and enjoy being part of. The next step is to figure out what’s going to happen there.