A CRC PRESS FREEBOOK

Practices of Game Design & Indie Game Marketing

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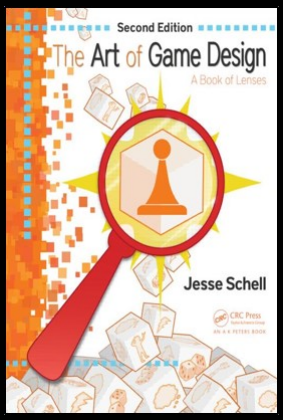

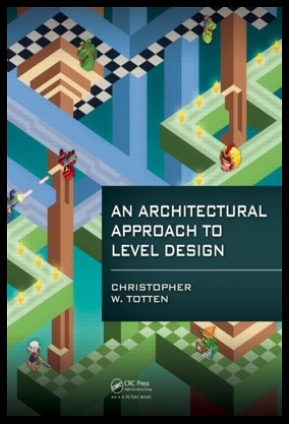

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Introduction

About this Free Book

The GameDev.net FreeBook, Practices of Game Design & Indie Game Marketing, is relevant to game designers, developers, and those interested in learning more about the challenges in game development. We know game development can be a tough discipline and business, so we picked several chapters from CRC Press titles that we thought would be of interest to you, the GameDev.net audience, in your journey to design, develop, and market your next game.

These titles from CRC Press include:

The Game Begins with an Idea from *The Art of Game Design: A Book of Lenses, Second Edition* written by Jesse Schell

This book discusses how the basic principles of psychology that work for board games, card games, and athletic games are also the keys to making top-quality video games. By taking a practical approach to game design and focusing on what makes people tick, developers can learn how to create powerful and meaningful experiences in their games.

Marketing Vehicles That Can Work Well For Indies from *A Practical Guide to Indie Game Marketing*, written by Joel Dreskin

Marketing can be as vital to the success of an indie game as the game itself. This book is written for the indie developer learning how to ensure marketing success, even on a small budget and with limited resources.

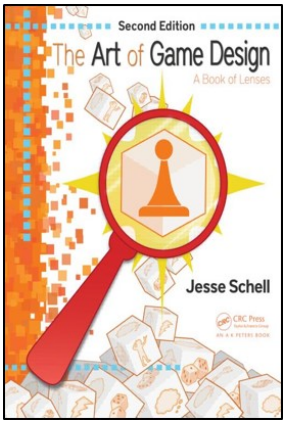
Basic Gamespaces from *An Architectural Approach to Level Design*, written by Christopher W. Totten

Written by a game developer and professor trained in architecture, this is one of the first books to integrate architectural and spatial design theory with the field of level design.

Please note this FreeBook does not include references, endnotes and footnotes. Fully referenced versions of each book can be accessed through crcpress.com.

CHAPTER 1

The Game Begins with an Idea



CHAPTER SEVEN

The Game Begins with an *Idea*

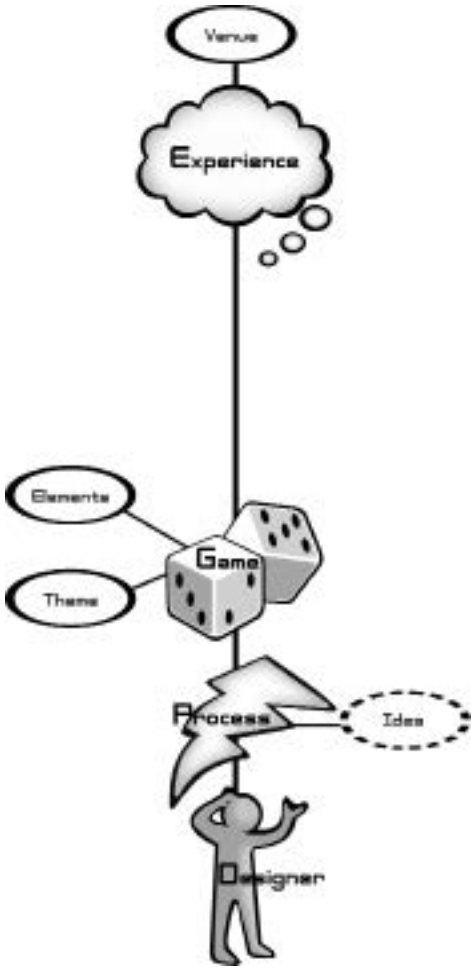


FIGURE 7.1

Hopefully, this book will inspire you to try designing some games of your own. When you do that (maybe you have already), you might be thinking that you aren't going about it the right way, not using the methods that "real" game designers use. I'm guessing the method you used to design your games was something like:

1. Think of an idea.
2. Try it out.
3. Keep changing it and testing it until it seems good enough.

Which sounds kind of amateurish. Well, guess what? That is exactly what real game designers do. and this chapter would end here, except for the fact that some ways to do these things are better than others. You already know *what* to do. In this chapter and the next, we are going to discuss *how* to do it as well as possible.

Inspiration

as I mentioned earlier, I worked for several years as a professional juggler. When I was about fourteen years old, and my repertoire of tricks was limited to two, I attended my first juggling festival. If you haven't attended one, they are remarkable to see—they mainly consist of jugglers of all levels of skill and ability standing around in a large gymnasium, talking about, experimenting with, and sharing new techniques. It is a place where you can attempt the impossible and drop with- out shame. but attending alone, my first time, it didn't feel that way. I was incredibly nervous—after all, I wasn't a "real" juggler. I mostly walked around, eyes wide, hands in my pockets, terrified that someone would point and shout, "Hey! What's HE doing here?" but of course, that didn't happen. Everyone at the festival had learned just like I had—they had taught themselves. Once I grew comfortable, I shyly took out my beanbags and did a little practicing of my own. I watched other people do tricks, and I tried imitating them—sometimes I could do it. but as I looked around for more examples of techniques to try, there was one juggler who stood out from the rest. He was an old man in a powder blue jumpsuit, and his tricks were not like the others at all. He used patterns and rhythms that were unique, and his tricks, though not astonishing in their difficulty, were simply beautiful to watch. I had to watch a long time before I realized that some of the tricks that seemed so special and unique when he did them were things *I could already do*—but when he did them, they had such a different style, a different feeling, that they seemed like something completely new. I watched him for about twenty minutes, and suddenly he looked at me and said, "Well?"

"Well, what?" I said, kind of embarrassed.

"aren't you going to try to copy me?"

"I—I don't think I would know how," I stammered out.

He laughed. "Yeah, they never can. Know why my tricks look so different?"

"Uh, practice?" I managed.

"No—everybody practices. Look around! They're all practicing. No, my tricks look different because of where I get them. These guys, they get their tricks from each other. Which is fine—you can learn a lot that way. but it will never make you stand out."

I thought about it. "So where do you get them?" I asked. "books?"

"Ha! books. That's a good one. No, not books. You wanna know the secret?"

"Sure."

"The secret is: don't look to other jugglers for inspiration—*look everywhere else*." He proceeded to do a beautiful looping pattern, where his arms kind of spiraled, and he turned occasional pirouettes. "I learned that one watching a ballet in New York. and this one…" he did a move that involved the balls popping up and down as his hands fluttered delicately back and forth. "I learned that from a flock of geese I saw take off from a lake up in Maine. and this," he did a weird mechanical looking movement where the balls almost appeared to move at right angles. "I learned that from a paper punch machine on Long Island." He laughed a little and stopped juggling for a minute. "People try to copy these moves, but they can't. They always try… yeah, look at that fella, over there!" He pointed to a juggler with a long pony- tail across the gym who was doing the "ballet" move. but it just looked dumb. Something was missing, but I couldn't say what.

"See, these guys can copy my moves, but they can't copy my inspiration." He juggled a pattern that made me think of a spiraling double helix. Just then, the Pa announced a beginner's workshop—I thanked him and ran off. I didn't see him again, but I never forgot him. I wish I knew his name, because his advice changed my approach to creativity forever.

Lens #13: The Lens of Infinite Inspiration

When you know how to listen, everybody is the guru.

—Ram Dass

To use this lens, stop looking at your game and stop looking at games like it. Instead, *look everywhere else*.

ask yourself these questions:

- What is an experience I have had in my life that I would want to share with others?
- In what small way can I capture the essence of that experience and put it into my game?

Using this lens requires an open mind and a big imagination. You need to search your feelings and observe everything around you. You must be willing to try the impossible—for surely it is impossible for a roll of the dice to capture the excitement of a swordfight or for a videogame to make a player feel afraid of the dark—isn't it? Use this lens to find the nongame experiences that will inspire your game. Your choices in the different quadrants of the tetrad (technology, mechanics, story, and aesthetics) can each be united by a single inspiration, or each can build on different inspirations, blending them together to create something entirely new. When you have concrete visions based on real life that guide your decision making, your experience will acquire an undeniable power, strength, and uniqueness.

This lens works hand in hand with lens #1, *Essential Experience*. Use the lens of Infinite Inspiration to seek and find beautiful experiences and the lens of Essential Experience to bring them into your game.

Designer Chris Klug encourages all designers to find one key emotional experience to build your game around, which he calls "the emotional heart of art direction." This notion is backed up by others. four graduate students undertook to create fifty videogames in a single semester and wrote about what they learned in the excellent essay "How to Prototype a Game in Under 7 Days." The following is an excerpt:

> *As an alternative to brainstorming, we found that gathering art and music with some personal significance was particularly fruitful. People have commented that many of the games like "Gravity Head" or "On a Rainy Day" create a strong mood and have strong emotional appeal. It's no accident. In these and many other cases, the soundtrack and initial art created a combined feeling that drove much of the gameplay decisions, story, and final art.*
>
> *Mr. Gabler: "The idea behind 'Tower of Goo' came up while I was listening to (for some reason) the opening to Astor Piazzolla's 'Tango Apasionado' after walking home, and had this drizzly vision of a town at sunset where everyone was leaving their houses, carrying out chairs, tables, and anything they could to build a giant tower in the center of their city. I didn't know why exactly, but they wanted to climb up and up and up - but they weren't very good civil engineers so you had to help them. The final prototype ended up a little more cheery, and I replaced the final music with Piazzolla's more upbeat 'Libertango,' but here's a case where an initial emotional target basically wrote the entire game."*

Inspiration is one of the secrets behind the strongest games. but how can you turn inspiration into a great game design?

The first step is admitting you have a problem.

State the Problem

The purpose of design is to solve problems, and game design is no exception. before you start coming up with ideas, you need to be certain of why you are doing it, and a problem statement is a way to state that clearly. Good problem statements tell both your goal and your constraints. for example, your initial problem statement might be:

"How can I make a browser-based game that teenagers will really like?"

This makes clear both your goal (something teenagers will really like) and your constraints (it must be a browser-based game). One advantage of stating things so clearly is that it can make you realize that you might be mistakenly over constraining the real problem. Maybe you've been thinking "browser-based game," but really, there is no reason that what you create has to be a game at all—maybe some kind of browser-based toy or activity would be okay as long as teenagers really like it. So, you might restate your problem in broader terms:

"How can I make a browser-based experience that teenagers really like?"

It is crucial that you get the problem statement right—if you make it too broad, you might come up with designs that don't meet your true goal, and if you make it too narrow (because you were focusing on solutions instead of the problem), you might cut yourself off from some clever solutions because you assumed that a certain kind of solution was the only valid one for your problem. People who come up with clever solutions are almost always the same people who take the time to figure out the real problem.

There are three advantages of clearly stating your problem:

1. *Broader creative space*. Most people jump to solutions too fast and start their creative process there. If you start your process at the problem instead of at a proposed solution, you will be able to explore a broader creative space and find solutions that are hiding where no one else is looking.
2. *Clear measurement*. You have a clear measurement of the quality of proposed ideas: How well do they solve the problem?
3. *Better communication*. When you are designing with a team, communication is much easier if the problem has been clearly stated. Very often, collaborators will be trying to solve quite different problems and not realize it if the problem has not been clearly stated.

Sometimes, you will have already explored several ideas before you realize what the problem "really" is. That's fine! Just make sure you go back and restate the problem clearly, once you see what it is.

a completed game design will cover all four elements of the elemental tetrad: technology, mechanics, story, and aesthetics. Often, your problem statement will constrain you to some established decisions about one (or more) of the four elements, and you will have to build from there. as you try to state your problem, it

can be useful to examine it from the point of view of the tetrad to check where you have design freedom and where you don't. Take a look at these four problem statements: Which ones have already made decisions in what parts of the tetrad?

1. How can I make a board game that uses the properties of magnets in an interesting way?
2. How can I make a videogame that tells the story of Hansel and Gretel?
3. How can I make a game that feels like a surrealist painting?
4. How can I improve on Tetris?

What if, by some miracle, you have no constraints? What if somehow you have the liberty to make a game about anything, anything at all, using any medium you like? If that is the case (and it seems highly unlikely!), you need to decide some constraints. Pick a story you might like to pursue or a game mechanic you would like to explore. The moment you pick something, you will have a problem statement. Viewing your game as the solution to a problem is a useful perspective and also lens #14.

Lens #14: The Lens of the Problem Statement

To use this lens, think of your game as the solution to a problem.
ask yourself these questions:

- What problem, or problems, am I really trying to solve?
- Have I been making assumptions about this game that really have nothing to do with its true purpose?
- Is a game really the best solution? Why?
- How will I be able to tell if the problem is solved?

Defining the constraints and goals for your game as a problem statement can help move you to a clear game design much more quickly.

How to Sleep

We have stated our problem and are ready to brainstorm! at least we will be, once we have properly prepared. Sleep is crucial to the process of idea generation—a good designer uses the tremendous power of sleep to its maximum advantage.

No one explains this better, I think, than surrealist painter Salvador Dali. The following (Dali's Secret #3) is an excerpt from his book *Fifty Secrets of Magic Craftsmanship*:

> *In order to make use of the slumber with a key you must seat yourself in a bony armchair, preferably of Spanish style, with your head tilted back and resting on the stretched leather back. Your two hands must hang beyond the arms of the chair, to which your own must be soldered in a supineness of complete relaxation…*
>
> *In this posture, you must hold a heavy key which you will keep suspended, delicately pressed between the extremities of the thumb and forefinger of your left hand. Under the key you will previously have placed a plate upside down on the floor. Having made these preparations, you will have merely to let yourself be progressively invaded by a sense of serene afternoon sleep, like the spiritual drop of anisette of your soul rising in the cube of sugar of your body. The moment the key drops from your fingers, you may be sure that the noise of its fall on the upside-down plate will awaken you, and you may be equally sure that this fugitive moment during which you cannot be assured of having really slept is totally sufficient, inasmuch as not a second more is needed for your whole physical and psychic being to be revivified by just the necessary amount of repose.*

Your Silent Partner

> *We are so captivated by and entangled in our subjective consciousness that we have forgotten the age-old fact that God speaks chiefly through dreams and visions.*
>
> —Carl Jung

Is Dali crazy? The benefits of a good night's sleep are easy to believe—but what possible benefit could there be in a nap that lasts only a fraction of a second? The answer becomes clear only when you consider where your ideas come from. Most of our good, clever, creative ideas are not arrived at through a process of logical, reasoned argument. No, the really good ideas just seem to pop up out of nowhere; that is, they come from somewhere below the surface of our consciousness—a place we call the subconscious. The subconscious mind is not well understood, but it is a source of tremendous, and possibly all, creative power.

Proof of this power is evident when we consider our dreams. Your subconscious has been creating these fascinating little comedies and dramas, each one different, three shows nightly, since *before you were born*. far from a sequence of random images, most people frequently have dreams that are quite meaningful. There are many known instances of important problems solved in dreams. One of the most famous is the story of the chemist Friedrich Von Kekule who had long been puzzling

over the structure of benzene (C_6H_6). No matter how he or anyone else tried to make the chains of atoms fit together, it didn't work. Nothing about them made sense, and some scientists were wondering if this pointed to a fundamental misunderstanding about the nature of molecular bonding. and then, his dream:

> *Again the atoms danced before my eyes. My mind's eye, sharpened by many previous experiences, distinguished larger structures of diverse forms, long series, closely joined together; all in motion, turning and twisting like serpents. But see what was that? One serpent had seized its own tail and this image whirled defiantly before my eyes. As by a lightning flash, I awoke.*

and upon awakening, he knew that benzene's structure was a ring shape. Now, would you say Kekule himself thought of the solution? from his description, he merely watched the solution play out in front of him and recognized it when he saw it. It was as if the author of the dreams had solved the problem and was merely presenting it to Kekule. but who is the author of these dreams?

On one level, the subconscious mind is part of us, but on another, it seems to be quite separate. Some people become quite uncomfortable at the idea of regarding one's subconscious mind as another person. It is an idea that sounds, well, kind of crazy. but creativity is crazy, so that shouldn't stop us—in fact, it should encourage us. So, why not treat it like a separate entity? No one has to know—it can be your little secret. bizarre as it sounds, treating your subconscious like another person can be quite useful, because as humans, we like to anthropomorphize things, because it gives us a well-understood model for thinking about and interacting with them. You won't be alone in this practice—creative minds have been doing it for thousands of years. Stephen King describes his silent partner in his book *On Writing*:

> *There is a muse (traditionally, the muses were women, but mine's a guy; I'm afraid we'll just have to live with that), but he's not going to come fluttering down into your writing room and scatter creative fairy-dust all over your typewriter or computer station. He lives in the ground. He's a basement guy. You have to descend to his level, and once you get down there you have to furnish an apartment for him to live in. You have to do all the grunt labor, in other words, while the muse sits and smokes cigars and admires his bowling trophies and pretends to ignore you. Do you think this is fair? I think it's fair. He may not be much to look at, that muse-guy, and he may not be much of a conversationalist (what I get out of mine is mostly surly grunts, unless he's on duty), but he's got the inspiration. It's right that you should do all the work and burn all the midnight oil, because the guy with the cigar and the little wings has got a bag of magic. There's stuff in there that can change your life.*
>
> *Believe me, I know.*

So, if we pretend our creative subconscious is another person, what is that person like? You might already have a mental picture of yours. Here are some common characteristics of the creative subconscious that most people seem to share:

- **Can't talk**, or at least chooses not to. Not in words, anyway. Tends to communicate through imagery and emotions.
- **Impulsive.** Tends not to plan ahead, tends to live in the moment.
- **Emotional**. Gets swept up in whatever you are feeling—happy, angry, excited, afraid—the subconscious seems to feel things more deeply and more powerfully than the conscious mind.
- **Playful**. It has a constant curiosity and loves wordplay and pranks.
- **Irrational**. Not bound by logic and rationality, the subconscious comes up with ideas that often make no sense. Need to go to the moon? Perhaps a long ladder will work. Sometimes these ideas are a useless distraction, but sometimes they are the clever perspective you have sought all along—whoever heard of a ring molecule, for example?

I sometimes wonder if the long-term appeal of the character of Harpo Marx, from the Marx brothers films, has to do with the fact that he matches the profile of the creative subconscious almost perfectly—perhaps this is his resonant theme. Harpo doesn't speak (or doesn't care to), is impulsive (eats whatever he sees, chases girls, gets into fights), is very emotional (always laughing, crying, or having fits of anger), is always playful, and is certainly irrational. However, his crazy solutions to problems often save the day, and in quiet moments, he plays music of angelic beauty— not for the praise of others but simply for the joy of doing it. I like to think of Harpo as the patron saint of the creative subconscious (see figure 7.2).

FIGURE 7.2

Salvador Dali paints a portrait of Harpo Marx on a dinner plate.

Sometimes, though, working with the creative subconscious can make you feel like you have a deranged four-year-old living inside your head. Without the rational mind to plan things out, take precautions, and set things straight, this guy would never survive on his own. for this reason, many people get in the habit of ignoring what the subconscious mind suggests. If you are doing your taxes, that is probably a good idea. but if you are brainstorming about games, your silent partner is more powerful than you are. Keep in mind that he has been creating entertaining virtual worlds for you each night, since before you were born, and he is more in touch with the essence of experience than you can ever hope to be. Here are some tips for getting the most out of this unusual creative partnership.

Subconscious Tip #1: Pay Attention

> *"Should we be mindful of dreams?" Joseph asked. "Can we interpret them?" The Master looked into his eyes and said tersely: "We should be mindful of everything, for we can interpret everything."*
>
> —Herman Hesse, *The Glass Bead Game*

as usual, the key is listening, this time to your *self* (sort of). The subconscious is no different than anyone else: if you get in the habit of ignoring it, it is going to stop making suggestions. If you get in the habit of listening to it, seriously considering its ideas, and thanking it when you get a good one, it will start to offer more and better suggestions. So, how do you listen to something that can't talk? What you must do is pay closer attention to your thoughts, your feelings, your emotions, and your dreams, for those are the ways the subconscious communicates. This sounds really strange, but it really does work—the more you pay attention to what the subconscious has to say, the more work it will do for you.

for example, say you are brainstorming ideas for a surfing game. You are thinking about which beaches it should be set at and what kind of camera systems are going to be best for a surfing game. Suddenly, you have this inkling of an idea: "What if the surfboards were bananas?" which is crazy, of course—and where do you think it came from? Now, you could say to yourself, "That's stupid— let's constrain this to reality, please." Or you could take a few moments and seriously consider the idea: "Okay, so what if the surfboards *were* bananas?" and then another thought comes: "With monkeys surfing on them." and suddenly, this doesn't seem so dumb—maybe this banana surfing monkey game could be something different, something new, something that might gain you a wider audience than the more realistic game you had originally planned. and even if you ultimately reject the idea, your subconscious might feel a little more respected and take part more seriously in the brainstorming process because of the time you spent considering its suggestions—and what did it cost you? Only a few seconds of quiet reflection.

Subconscious Tip #2: Record Your Ideas

Certainly you will record your ideas during a brainstorming session, but why not record them all the time? The human memory is terrible. by recording all of your ideas, two things happen. First, you'll have a record of many ideas that you would likely have forgotten otherwise, and second, you'll free up your mind to think of other things. When you think of an important idea and you don't write it down, it kind of bangs around up there, taking up space and mental energy, because your mind recognizes it as important and doesn't want to forget the important idea. Something magic happens when you record it—it is like your mind doesn't feel the need to think about the idea as much. I find it makes my mind feel clean and open, as opposed to cluttered and cramped. The Japanese call this mental state "mizu no kokoro," often translated as "mind like water." It leaves the freedom to think seriously about the design of the day, without tripping over the clutter of important unrecorded ideas. an inexpensive voice recorder or voice recorder app can be an invaluable tool for a game designer. Whenever an interesting idea comes to you, just speak it into the recorder and deal with it later. You have to have the discipline to periodically transcribe those recordings, but really, that is a small price to pay for a huge idea collection and a clean mental workspace.

Subconscious Tip #3: Manage Its Appetites (Judiciously)

Let's be honest here—the subconscious mind has appetites, some of which are primal. These appetites seem to be part of its job—just as it is the rational mind's job to determine which appetites can be safely fed and how to go about doing that. If the subconscious mind feels one of these appetites too strongly, it will obsess about it. When it is obsessing, it can't do good creative work. If you are trying to come up with new ideas for a real-time strategy game and all you can think about is candy bars or how your girlfriend left you or how much you hate your roommate, you aren't going to be able to get much good work done, because these intrusive thoughts will distract you and the source of these intrusive thoughts, your subconscious mind, isn't getting any work done either and he's the one who has to do the heavy lifting. Maslow's hierarchy, which we'll discuss in Chapter 11, "Motivation," is a pretty good guide here—if you don't have food, safety, and healthy personal relationships, it will be hard to do self-actualizing creative work. So, make it a priority to get these things worked out, and come up with compromises that will keep your subconscious satisfied so it can spend its time coming up with genius ideas. Use good judgment, of course—some appetites are dangerous and should be curbed, not fed, for if you feed them, they tend to grow, which makes everything much worse in the long term. It is possible that the tendency for so many creative types to self-destruct may be the result of a close, but poorly managed, relationship with their subconscious mind.

Subconscious Tip #4: Sleep

> *It is a common experience that a problem difficult at night is resolved in the morning after the committee of sleep has worked on it.*
>
> —John Steinbeck

As Salvador Dali points out, sleep is crucial and not just the slumber with a key. We used to think that sleep was for the body—but it has become clear that sleep is primarily for the benefit of the mind. Some strange process of sorting, filing, and reorganizing seems to be going on when we sleep. Clearly, the subconscious is wide awake and active for at least a part of the sleep cycle—the part that features dreams. I have built up my relationship with my own creative subconscious to the point that I sometimes get a sense of when he "is around" or "is not around," and I certainly find that when I haven't had enough sleep, often he isn't around. It feels like he takes naps when I (we?) haven't had enough sleep or at least he isn't participating much in what I'm doing, and this absence shows in my work. I have been in more than one brainstorming meeting where I was contributing almost nothing useful, and then just following a feeling of him "showing up," a flood of useful ideas came forth.

Subconscious Tip #5: Don't Push Too Hard

> *So now you must labor with your brains, and now you must forbear your activity, and see what the great Soul showeth.*
>
> —Ralph Waldo Emerson

> *You don't have ideas – they just let you know when they're ready.*
>
> —Stephen Moffat

Did you ever try to think of a name during a conversation, maybe someone you know, maybe some movie star, and you know you know it, but just can't think of it? So you squint your eyes and try and force the answer out of your mind—but it just doesn't come. So, you give up and move on, talking about something else. a few minutes later, suddenly the answer pops into your mind. Now, where do you think that came from? It is as if the subconscious was working on the problem of finding that name in the background while you moved on to other things. When it found the answer, it gave it to you. No amount of concentration or straining was going to move it along faster; in fact, this seems to slow the process down, because who can work with someone looming over their shoulder? The same goes for your creative work. Don't expect immediate answers from your subconscious. Give it a problem to solve (one more advantage of a clear problem statement!), make clear the problem

is important, and leave it to do its work. The answer might come quickly, it might come slowly, or it might not come at all. but nagging and looming won't make it come any faster—it will just slow things down.

A Personal Relationship

You may find that your relationship with your subconscious is different than what I describe here. This is expected—different people's minds work in different ways. The important thing is that you find the techniques that work best for you, and the only way you can do that is by following your instincts (hints from the subconscious) about what will be creatively productive and start trying experiments. Some of these will be necessarily strange. Slumber with a key is strange, but it worked for Dali. Treating your subconscious mind like a full-time roommate is strange, but it works for Stephen King. To become the best game designer you can be, you must find the techniques that work for you, and no one can tell you what those are—you must discover them yourself.

Sixteen Nitty-Gritty Brainstorming Tips

> *Creativity is for people who don't have a good idea in the first place.*
>
> —Anonymous

You and your silent partner are ready to tackle your problem. Now comes the fun part: brainstorming! That is, it's fun when the ideas come—when they don't, it's terrifying! So, how can you make sure they do come?

Brainstorm Tip #1: The Write Answer

You've stated your problem. Now, start writing down solutions! Why write them down? Why not just sit and think until that brilliant idea comes to you? because your memory is terrible! You are going to want to mix and match little pieces from dozens, if not hundreds, of ideas and you will never be able to remember them all. Even worse, as we discussed earlier, when you have many disconnected ideas in your head, they can crowd out new ideas. So, make room! Were you ever really mad at someone so you wrote them a nasty letter (which you might have never sent) and immediately felt better? Something magic happens when you put your ideas on paper. So do it!

Brainstorm Tip #2: Write or Type?

What is the best way to record your ideas? Whatever works best for you! Some people like typing best, some like writing. Cartoonist and writer Lynda Barry insists

that there is magic in a moving pen that pulls ideas out of your mind in a way that a computer keyboard can never match, and I tend to agree.

I personally like writing on unlined paper, because it allows for more expression and creativity—you can circle ideas, draw little sketches, connect ideas with arrows, cross things out, etc. You can always type up the good stuff later.

Brainstorm Tip #3: Sketch

Not all ideas can be easily expressed through text. So draw some pictures! It doesn't matter that you can't draw—try! When you express your ideas visually, not only will you remember them more easily, the pictures you draw will trigger more ideas. Try this out. You'll be surprised at how well it works. Need to make a game about mice? Start drawing some mice—real rough—just crude little mouse blobs. I guarantee you will find ideas popping into your head that simply weren't there a minute ago.

Brainstorm Tip #4: Toys

another way to get your mind visually engaged in your problem is to bring some toys to the table. Pick some that have something to do with your problem and some that have nothing to do with it! Why do you think that restaurants like TGI Friday's have all that crazy stuff on the walls? Is it just decoration? No. When people see it, they think of things to talk about, and the more things they think of to talk about, the more enjoyable their restaurant experience. If it works for restaurateurs, it can work for you. Toys don't just visually engage your creativity—they also engage it in a tactile way. Even better, why not bring a big lump of clay, or Play-Doh, so you can make little sculptures of your ideas? It sounds silly, but *creativity is silly*.

Brainstorm Tip #5: Change Your Perspective

The whole point of the lenses in this book is that they get you looking at your game from different perspectives. but why stop there? Don't just brainstorm sitting in your chair—stand up on your chair—things look different up there! Go to different places—immerse yourself in different things. brainstorm on the bus, at the beach, at the mall, or in a toy store, while standing on your head—anything that sparks your imagination and makes you think of new things is worth doing.

Brainstorm Tip #6: Immerse Yourself

You've stated your problem; now immerse yourself in it! find people in your target audience at the mall—what are they buying? Why? Eavesdrop on them—what are they talking about? What is important to them? You need to know these people

intimately. Have you settled on a technology already? Learn everything you can about it—cover your walls with its specs—find that secret thing it can do that no one has noticed yet. are you locked into a theme or storyline? find other adaptations of similar stories and read or watch them. Do you need to do something new with an old gameplay mechanic? Play as many games that use that mechanic as you can find—and some that don't!

Brainstorm Tip #7: Crack Jokes

Some people are nervous about using humor to do serious work, but when you are brainstorming, sometimes jokes are what get the job done. Jokes (Can you be a closet claustrophobic?) loosen up our minds (Is it possible to be totally partial?) and make us see things from a perspective that we missed before (Save the whales! Collect the whole set!)—and new perspectives are how great ideas happen! be warned, though! Jokes can get you off track, especially in a group setting. It's fine to get off track sometimes (the good ideas might not be on the track); just make it your responsibility to get things back on track. a brainstorming commandment to live by: "He who derails, rerails."

Brainstorm Tip #8: Spare No Expense

from childhood, most of us are trained not to waste resources: "Don't use the good markers!" "Don't waste paper!" "Don't waste money!" brainstorming is not the time to be frugal. Never let materials get in the way of your creativity. You are going to be trying to find the million dollar ideas—you can't let a few pennies for paper or ink get in the way. When brainstorming, I like to use a fancy pen and heavy gauge paper, and I like to write in big letters, only using one side of the paper. Why? Partly because I can lay out all the sheets on the table, or on the floor, and consider all the ideas from a distance if I need to. Partly because it gives the process a certain dignity. but partly because it just feels right! and when brainstorming, you need to do what feels right for you—every little thing you do that makes you a little more creatively comfortable increases the chances that the great idea will come. and what is right for one person isn't right for everyone—you must constantly experiment to find what works best. but if you can't get the materials you prefer, don't you dare whine about it—use what you've got! There is work to be done!

Brainstorm Tip #9: The Writing on the Wall

You might prefer writing on a whiteboard to writing on paper. If so, do it! If you are brainstorming in a team setting, you will need some kind of solution that everyone can see at once. Some people like to use index cards to write down their ideas.

These can be tacked to a bulletin board and have the advantage of being easily repositioned. The downside is that they are sometimes too small for a big idea. I find I prefer giant (2 ft × 2.5 ft) Post-it sheets (expensive, but we spare no expense!) or sheets of butcher paper with masking tape. This way, you can write lists on the wall but easily reposition them when you run out of room. Even better, you can take them down, stack them, roll them up, and store them. a year later, when someone says, "Hey, what were some of those robot game ideas we had last year?" you can go pull them out, stick them up, and restart your brainstorming session as if it had never stopped.

Brainstorm Tip #10: The Space Remembers

This excellent phrase is from the book *The Art of Innovation* by Tom Kelley. One more reason to put things on the wall: our memory for lists is bad, but our memory for where things are positioned around us is very good. by posting your ideas in the room all around you, you can more easily remember where they are. This is crucial, since you will be trying to find connections between dozens of different ideas and you need any help you can get—particularly if you will be brainstorming over several sessions. It is quite remarkable. If you put a bunch of ideas up on the walls and you go away for a few weeks, you will forget most of it. but walk back into that room where the ideas are posted, and it feels like you never left.

Brainstorm Tip #11: Write Everything

> *The best way to have a good idea is to have a lot of ideas.*
>
> – **1**inus Pauling

You've got your fancy pens, your fancy paper, your fancy coffee, some toys, some modeling clay, everything you think you might need to be creative. Now you are waiting for that brilliant idea to come. Mistake! Don't wait—just start writing down everything you can think of that is remotely connected to your problem. Write down every stupid idea that comes into your head. and a lot of them will be stupid. but you have to get the stupid ones out of the way before the good ones start showing up. and sometimes a stupid idea becomes the inspiration for a genius idea, so write it all down. Don't censor yourself. You have to give up your fear of being wrong and your fear of looking silly. This is hard for most of us to do, but it comes with practice. and if you are brainstorming with other people, certainly don't censor them—their stupid ideas are just as good as your stupid ideas!

Brainstorm Tip #12: Number Your Lists

Much of your brainstorming will consist of lists. When you make lists, number them! This does two things: First, it makes the lists easier to discuss ("I like ideas 3 through 7, but 8 is my favorite!") and, secondly, and this is *extremely weird*, when a list of things is numbered, the numbers somehow give a certain dignity to the things in the list. Consider these two lists:

1. Chicken broth
2. Umbrellas
3. Wind
4. Spatulas

- Chicken broth
- Umbrellas
- Wind
- Spatulas

Don't the items in the numbered list seem more important, somehow? If one of them suddenly disappeared, you would be much more likely to notice. This dignity will make you (and others) more likely to take the ideas on the list seriously.

Brainstorm Tip #13: Destroy Your Assumptions

I learned this excellent tip from designer Rob Daviau. Make a list of everything about your game that you are assuming to be true, such as "I assume that it is designed to be played indoors," "I assume that the player will look at the screen," and "I assume the player only uses one finger to touch the screen." This can be a long list, because we assume so much. Once you have a good list, go through each item, and think about how your game would work if that assumption wasn't true. Most of the time, the assumption must stand. but once in a while, blowing up one of your assumptions will give you a great insight. Rob says he arrived at the design for *Risk: Legacy* when he considered destroying the standard board game assumption: "One game does not affect the next one."

Brainstorm Tip #14: Mix and Match Categories

It's great when game ideas, athena-like, spring forth from your head, fully formed. but it doesn't happen that way every time. a great technique for helping ideas come together is to brainstorm in categories. The elemental tetrad comes in handy here. for example, you might have decided you want to make

a game for teenage girls. You might make separate lists, which you can start to mix and match, something like the following:

Technology Ideas

1. Smartphone game
2. Virtual reality headset game
3. PC
4. Integrated with instant messaging
5. Game console

Mechanics Ideas

1. Sims-like game.
2. Interactive fiction game.
3. The winner makes the most friends.
4. Try to spread rumors about the other players.
5. Try to help as many people as possible.
6. Tetris-like game.

Story Ideas

1. High school drama.
2. College themed.
3. You play cupid.
4. You're a TV star.
5. Hospital theme.
6. Music theme.
    a. You're a rock star.
    b. You're a dancer.

Aesthetic Ideas

1. Cel shaded.
2. Anime style.
3. All characters are animals.
4. R&B music defines the game.
5. Edgy rock/punk music defines the feel.

Once you have lists like these (though you should have dozen more entries on each list!), you are free to start mixing and matching ideas—maybe a smartphone-based Tetris-like game, which has a hospital theme, where all the characters are animals.... Or how about a Sims-like console game based on high school with an anime style? by having all these lists of partial ideas that can easily be mixed and matched, fully formed game ideas that you might never have thought of start springing up all over the place, each taking on a life of their own. Don't be afraid to make up other categories, either, as you need them!

Brainstorm Tip #15: Talk to Yourself

There is tremendous social stigma against talking to yourself. but when brainstorming alone, some people find it really helpful—there is something about saying things out loud that makes them more real than just thinking them in your head. find a place where you can freely talk to yourself without getting funny looks. another trick, if you are brainstorming in a public place, hold a cell phone next to your head while you talk to yourself—it's silly, but it works.

Brainstorm Tip #16: Find a Partner

When you brainstorm with other people, it is a very different experience than brainstorming alone. finding the right brainstorming partner can make a world of difference—sometimes the two of you can get to great solutions many times faster than either of you could alone, as you bounce ideas back and forth and complete one another's sentences. Just having someone to talk out loud to, even if they say nothing, can sometimes move the process along faster. Do keep in mind that adding more and more people doesn't necessarily help, though. Usually, small groups of no more than four are best. Groups work best when brainstorming a narrow problem, not a broad, open-ended one. and, honestly, most groups go about brainstorming all wrong. Research shows that a group just showing up in a room trying to brainstorm cold on an idea is a recipe for wasted time. Much better is to have each individual brainstorm independently first and only *then* get together to share ideas, mix and match them, and solve problems together. also, certain people make bad brainstorming partners—these are usually people who try to poke holes in every idea or people who have very narrow tastes. These people are best avoided, and you'll be more productive without them. Team brainstorming can have tremendous benefits and tremendous perils, which we will discuss in greater detail in Chapter 25, "Team."

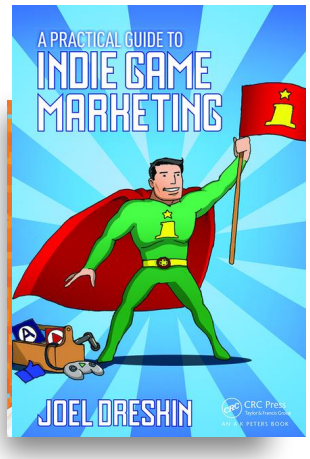
Look At All These Ideas! Now What?

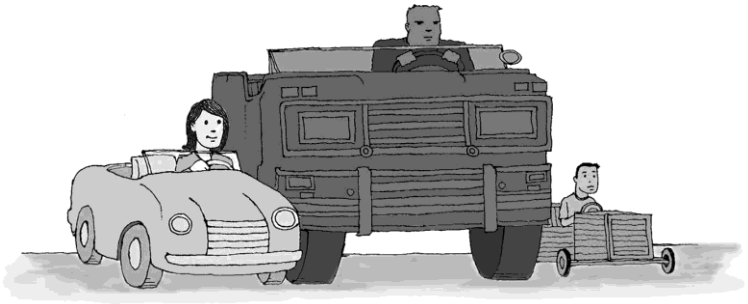
Our goal in this chapter was to "think of an idea." after a little brainstorming, you probably have a hundred! and this is how it should be. a game designer must be able to come up with dozens of ideas on any topic. as you practice, you will be able

to come up with more and better ideas in less time. but this is just the beginning of your design process. The next step is to narrow down this broad list of ideas and start doing something useful with them.

CHAPTER 2

Marketing Vehicles That Can Work Well for Indies





Chapter 5
Marketing Vehicles That Can Work Well for Indies

As you'd expect, an indie game's marketing campaign will vary considerably from a large publisher's game launch. This chapter focuses on the kinds of marketing programs that many indies have used effectively, with relatively moderate budgets. AAA games, marketing campaigns can periodically provide inspiration and ideas for lower cost executions.

Chapter Objective:

Discussion of different kinds of vehicles for marketing games, focusing on those that can work best for indies at lower spending levels.

Tip: Look for opportunities to market your game that:

- **Get your game in front of relevant audiences**. Go after venues and programs for getting people to experience and play the game.
- **Establish personal contacts and engage with influencers and gamers**. You'll find these personal contacts particularly beneficial as you continue building the presence for your studio and game. Cultivate relationships and gain supporters; these can yield returns as you grow.

PR

Given the power and potential for impact from press coverage, a separate chapter in this book dives into this topic in greater depth. Not surprisingly, journalists get many requests from game developers and publishers of all sizes to cover their games. Some games might not resonate for them as much as others. For this reason, you should establish marketing programs across multiple kinds of vehicles to supplement PR.

Tip: While PR can work very well for indie games, it's not a silver bullet. Be sure to include other kinds of marketing vehicles and programs in your plans.

Audience Development—Social Media, Email and Beyond

Audience development merits its own chapter in this book for similar reasons, with the substantive gains these kinds of programs can help to deliver. In contrast to PR, you'll have direct contact with your audience through these activities and greater control and ownership of when and how you communicate, as well as your brand. You can benefit tremendously by establishing and building these channels as early as possible. This can become one of your best assets, driving the success of your game, subsequent releases and your studio. These kinds of programs can include:

- **Email**—build your list and establish a regular schedule of mailings to your subscribers
- **Community forums**—online and in-game
- **Social media channels**—Facebook, Twitter, etc. . . . and new vehicles as they emerge
- **Your website**—project updates, content posts (e.g., screenshots, videos), blogs, and more
- **Video**—YouTube channel and subscribers, live streams

Tip: Start building your audience connections early—email mailing list, Twitter/Facebook followers, etc. You'll be thankful later that you started in the beginning and built your base continually over time as you get to a sizable audience and vehicles that you can use for communicating with them directly.

For best results, communicate regularly. For social media channels, you'll ideally want to post at least once per week. Communicating even more often can lead to higher levels of engagement and audience connections. You might start with fewer posts in the early stages of your project, and increase the frequency in the final months and weeks
before the game launch when you have more content and news to share.

You can build affinity by posting on topics that do not connect directly with your project—comment on industry events, trends, other games of interest and more. That said, if your posts diverge too far from topics your audience finds relevant, you might risk losing some followers and interest.

Channel

Impactful channel marketing opportunities for indies can include feature slots at different store fronts, as well as periodic promo programs. Those who can establish relationships with representatives at those channels (Steam, PlayStation Store, Xbox Live, etc.) can improve their chances for securing these promo slots. Conferences and trade shows can provide an excellent setting for building connections, particularly at shows where these organizations have a booth

presence. Stop by their space, introduce yourself, request business cards and build rapport with contacts. These teams frequently walk the floor as well. Keep an eye on the badges and company logo apparel of visitors to your booth and be sure to strike up conversations and collect contact information for notable people that stop by.

Events

Look for events where you can build visibility for your game, and explore different ways to establish your presence there. Along with valuable personal contacts and positive impressions you can create for your game at events, show organizers will often present additional kinds of marketing vehicles. For event participation, consider:

- Exhibiting your game on the show floor
- Submitting a proposal to speak on a panel or dedicated session at the event
- Purchasing space for promoting your game in signage around the event center and/or show guides
- Other marketing opportunities offered by event organizers

When event organizers present their marketing programs, they may include options with relatively low bang for the buck. Review and evaluate these with a skeptical eye.

Press and industry execs often attend events, particularly bigger shows in larger cities, and these can help in building your network. As suggested in the preceding Channel section, keep an eye on the badges and company logo apparel of visitors to your booth, and be sure to strike up conversations and collect contact info for press and industry people that might stop by your space.

Tip: Look for ways to build your network of contacts through shows, events, meetups and more. These kinds of personal connections can yield tremendous benefits over time.

Promotions

You can set up periodic promotions to provide additional sales boosts for your games. You can pursue inclusion in campaigns fielded by large channels (e.g., holiday sales), and you might run other promos on your own. While many focus on pricing promotions—particularly since these can perform quite well—you can also arrange for different kinds of initiatives. Look for ways you might add content or value in other ways, rather than just slashing the price.

Examples of promotion types:

- **Time-limited price promotion.** These can span a single day, multiple days or a week (run rates tend to decline after one week).
- **Add on content.** You can expand your game's scope with new levels, characters, themes, etc., and establish promotional campaigns to help create exposure for this new content.
- **Holiday tie in.** Consider less common as well as traditional tie-ins for promotions, such as celebrating the beginning of summer/end of school year, start of spring, a presidential election, Friday the 13th . . . be imaginative!
- **Milestones**. Commemorate a game's initial release anniversary, "birthday" of a lead character in the game, unit sales peaks (XX,000 units sold!) and more.
- **Bundles**. Large established channels as well as dedicated bundle consolidators field bundle promos that have performed quite well with strong price and value propositions. Humble Bundle is one example of an organization that has generated sizable sales volumes for indie games.

Arrange for promotions several months after the game's initial release to help in maximizing revenues early in the game's life cycle, as well as initiatives at predetermined times later in the year. Some will run introductory specials at launch time—particularly for lesser known games—to give prospective customers the final motivation they might need to make the purchase.

Awards / Competitions

Awards competitions can provide excellent ways to create visibility. You'll find relatively low entry fees for many of these. Awards evaluators—oftentimes, industry figures and influencers writing for popular websites or blogs—become familiar with your game through this process, which can lead to new opportunities.

Competitions often post finalists, providing more exposure. For those who win, the prizes and acclaim that come with victory help to open more doors for your game and generate additional visibility. Be sure to trumpet your achievements—including finalist selections—on your website, in your marketing materials, in signage at events, wherever you can!

Look for competitions of all sizes—large and small. Gamejams can also play a role here, with compelling game concepts and creators attracting interest through jam sessions.

Playable Code

Nothing shows off your project better than a playable version. While you can get your game in front of potential customers through appearances at regional shows, you'll reach the largest audience by distributing prerelease versions online: a public beta, demo or early access version of the game.

With a publicly distributed version, you'll want to make sure you don't include *too* much, so you whet the player's appetite for ultimately getting the final game!

You should generally schedule your playable public release for a date in relatively close proximity to your launch. Otherwise, the player's interest may wane or might get diverted to other games between the time of your playable code release and your launch.

Tip: Don't include too much in a prerelease version of your game or post it too far in advance of your expected launch. Look for ways to use an early release to spark the audience's interest shortly before your game release approaches to whet their appetites for more!

Your Website

You have more control over your website than over most other vehicles. While many have created super flashy websites, with bells, whistles and fireworks, you should think about function over form.

Core elements to consider for your website:

- **Engaging central content** to draw viewers in and prompt interest in your game—such as a splash image or video
- **Timely news and project updates**, highlighted in a prominent place on your home page—perhaps in blog format
- **Prominent links for building engagement—**through your Face- book page, Twitter account, Twitch/YouTube channel
- **Email mailing list sign-up prompt**
- **Core game information—**game description, availability timing, platforms, how to buy, pricing
- **"About" and "Press" sections**
  - **About—**for more information about your studio, team, game(s)
  - **Press—**to assist press with covering your game, including con- tact info, key assets for download and possibly links to article highlights

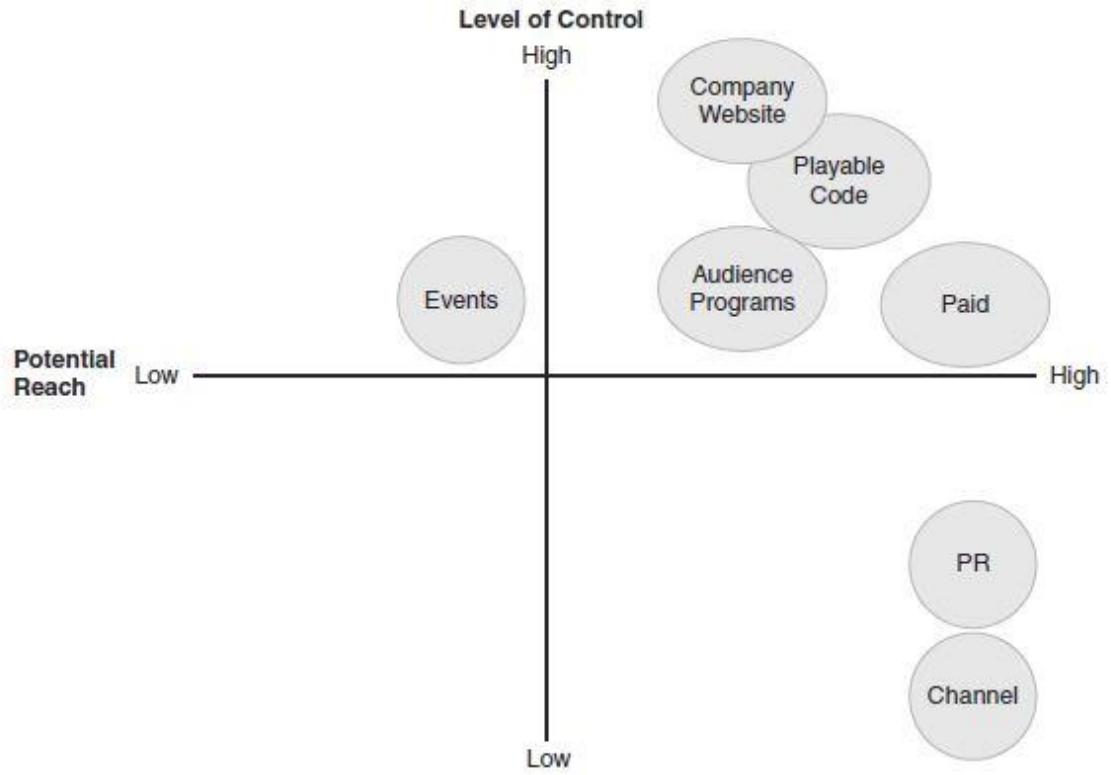
Website stats tools can prove invaluable for tracking traffic as you ramp up your game launch, assessing how different initiatives increase visitors and interest at your site and assisting with evaluating program performance.

Paid

Through research and focused inquiries, you can find places to run paid ads that fit your budget best. You'll want to make sure you're placing ads with reputable organizations that reach a likely audience for your game. Smaller, focused outlets will probably work best for your budget, rather than large websites and publications which can cost quite a bit more.

This diagram visually maps benefits and challenges of different kinds of vehicles. While PR and channel programs can prove very impactful, marketers and game creators cannot directly control

when and how they can get utilized. The channel and press gatekeepers are in charge there. You can control the message on your website, audience programs and public demos. Building out these areas can yield tremendous gains in reach and influence. While you can control the presentation and



experience at shows, these reach a smaller audience at the event than other vehicles. Paid ad placements can reach a large audience, but you have less control over the communication environment.

Recommended Exercises:

1. Based on your game's characteristics, which vehicles do you think would work best for your next release and why?
2. Which indies do you think do a good job with each kind of vehicle described in this chapter? Document takeaways from this assess- ment to help with your next game marketing campaign.

Case Study: Supergiant Games

Preparation Meeting Opportunity

As discussed throughout this book, different teams have taken a variety of roads in the indie world. Supergiant Games, based in Northern California, provides an example that might seem like a dream from the outside. Taking a closer look, the team started from modest beginnings with many diligent days, weeks and months on development for its initial games and its own challenges. While they brought outstanding game development skills, instincts and inspiration to their projects, they also experienced the good fortune of very positive critical and gamer acclaim.

As first-century Roman philosopher Seneca wisely stated, "Luck is what happens when preparation meets opportunity."

Numerous teams bring similar attributes to their projects and don't get to the same results that Supergiant achieved in its first years. Other case studies in this book show varying paths from different indies. Let's take a closer look at Supergiant Games, to see how this played out for them.

Amir Rao and Gavin Simon worked together at EA, and then formed Supergiant Games with colleagues that included other former team members and childhood friends. The leads had honed their abilities through a number of AAA projects, while cultivating ideas for their own games. When they took the plunge, Supergiant worked out of Amir's father's house during the course of development for their first full game. Their team included Amir's childhood friend and *Dungeons & Dragons* group member Darren Korb, EA colleague and former videogame journalist Greg Kasavin and outstanding artist Jen Zee from the world of MMOs as well as comics and tabletop games, along with Supergiant chief technology officer (CTO) and programmer Andrew Wang and Darren's theatrically trained roommate Logan Cunningham to bring distinctive vocal character to the game.

As with other indies, Supergiant had a somewhat scrappy, ragtag, unconventional set up as it got started. The group's seasoning from earlier projects, creative inspiration, craftsmanship and love of games combined for something truly special in their first game *Bastion*. As described in the synopsis for the game on the Supergiant website — "*Bastion* is an action role-playing game

set in a lush imaginative world, in which players must create and fight for civilization's last refuge as a mysterious narrator marks their every move." Supergiant developed the game with seven team members and contributors over a 20-month period, with its first release exclusively on the Xbox online channel.

After initial one-on-one sessions showing *Bastion* to friends and colleagues at the San Francisco Game Developer's Conference shortly after the studio's founding, Supergiant's first big break came when the Penny Arcade team chose *Bastion* as one of the esteemed PAX10. Not only did this selection provide validation and recognition for their hard work, it helped create a foundation for tremendous opportunities, which Supergiant capitalized on—visibility with consumers, press meetings, and more. Throughout these early days, the studio began executing a robust communications plan for audience development—with regular posts to its blog as an anchor. They also benefited from a multi-part behind-the-scenes video feature at Giant Bomb, which helped create a connection with emerging fans of the project and gave an inside look at the people and work involved in a project like this. While Supergiant may not have crafted an orchestrated plan for these initiatives in advance, they took advantage of opportunities as they came along with very positive results.

Fast forwarding: Supergiant continued ramping up activities around the game—in connection with the next year's Game Developer's Conference and the Independent Games Festival, additional PAX events, E3, and more. Very high acclaim continued, with an excellent build to the *Bastion* launch on Xbox Live Arcade in Summer 2011.

At release time, top publications praised *Bastion*, and the game earned many awards and Best of Year honors including from *USA Today*, *Time*, NPR, CNN, *Wired*, *Entertainment Weekly*, Associated Press, Yahoo, IGN, and more.

Supergiant provides an example of a studio that has staged its releases for different platforms over time, with positive results. The team took the time to approach separate platforms thoughtfully, making the game the best it could be for each. They chose to have their internal team tune all versions, rather than outsourcing ports. The resulting reviews and game sales contribute to a validation of this approach for *Bastion*.

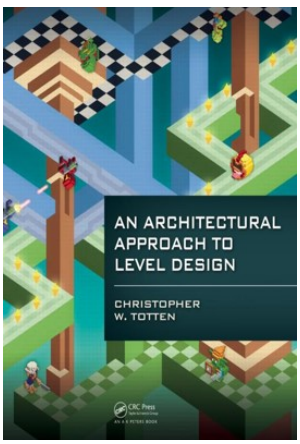
Within a relatively short period, Supergiant moved into production on its second game *Transistor*. *Transistor* carries forward a number of elements that characterized Supergiant's first game—Jen Zee's hand-painted visual style, the atmospheric narration and incredible craftsmanship, along with gameplay that reflects the team's many collective years as gaming enthusiasts and creators.

Concluding Notes

From modest beginnings in the living room of Amir Rao's father's home, Supergiant has achieved strong results for its initial games and positioned the studio well for future success. This came not only through early opportunities that the team capitalized on, but also many hours of diligent work, skill and very strong execution. It can be inspiring to see how well indie development and deployment can work when the stars align—while also looking at other indie stories where it might take two, three, four or more iterative game releases, with hits coming later on down the line.

CHAPTER 3

Basic Gamespaces



Basic Gamespaces

Architecture is the thoughtful making of space.

—LOUIS KAHN

This quote from famous architect Louis Kahn, similar to our own for level design, brings us to our next discussion on gamespaces. In Chapter 2, we explored some of the practical tools and methods with which we will design game levels, from planning on paper to constructing level geometry in game engines. Now we will discuss basic spatial arrangements that will enable us to create better gameplay experiences within our game levels.

First, you will learn about some simple spatial principles from architectural design: figure-ground, form-void, and others. Next, we will explore historic gamespaces such as the maze and labyrinth, learning how these ancient space types influence modern game structures. From these core explorations, we will explore other popular spatial types found in modern games and discover how they are used to enforce different gameplay mechanics.

Lastly, we will consider player point of view and discover what advantages and disadvantages are found in first, third, and other camera views.

What you will learn in this chapter:

Architectural spatial arrangements Historic gamespace

structures Spatial size types

Molecule level spaces

Form follows gameplay with proximity diagrams Hub spaces

Sandbox gamespaces Considerations of camera

Enemies as alternative architecture

ARCHITECTURAL SPATIAL ARRANGEMENTS

As with Chapter 2, we will begin with lessons from architecture. Whereas we previously focused on tools and techniques that were useful in game engine environments, this time we will discuss spatial arrangements that can be utilized in games.

Games and architecture differ in the fact that real-world architecture must conform to real-world rules. For example, real-world buildings must have both an interior and an exterior—with the shape of one influencing the other. Real-world architecture must also take into consideration weather, geology, zoning regulations, and structural realities. These are not things that gamespaces must deal with. To one extreme, this can mean experimental structures such as Atelier Ten Architects and GMO Tea Cup Communication, Inc.'s Museum of the Globe, a large elliptical structure formed from cubes floating in space (Figure 3.1) or Hidenori Watanave's explorable database sculpture on the life of Brazilian architect Oscar Niemeyer—both former structures within the virtual world *Second Life*. For more day-to-day level design, however, this means gamespaces that are free from interior/exterior requirements. This results in more freeform spatial layouts based on player movement patterns, narrative events, or game mechanics (Figure 3.2). Indeed, *interior* and *exterior* are little more than descriptions based on the art used to decorate the gamespace.

With these differences in mind, spatial designers for games can take advantage of architectural lessons within the freedom of game design environments. Some of these lessons even have conceptual links to how levels are constructed in many modern game engines.

Figure-Ground

The first architectural spatial arrangement we will explore is that of *figure-ground*. Figure-ground is derived from artistic notions of the *positive* and *negative* space of a composition, where positive space describes

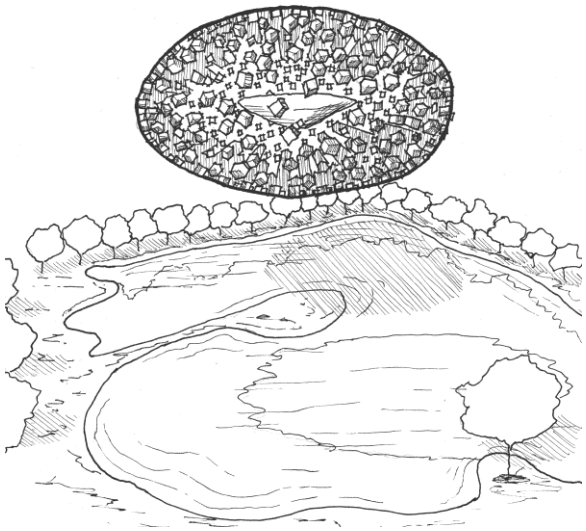


figure 3.1 A sketch of Atelier Ten Architects and GMO Tea Cup Communication, Inc.'s Museum of the Globe. Since the building is built within a virtual world, it does not require any structure to hold up the hundreds of cubes making up its main body. The designers designed the building's form in Microsoft Excel and then generated the geometry in an automatic modeling program.

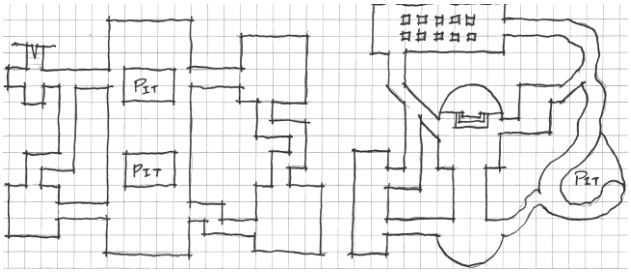


figure 3.2 Parti diagram sketches of level plans. Game levels can take on unusual formal characteristics because they do not have to conform to a corre- sponding interior or exterior as real buildings do.

the area inhabited by the subject of a piece and negative space describes space outside of or in between subjects (Figure 3.3).

Figure-ground theory in architecture comes from the arrangement of positive space figures, often poche'd building masses, within a negative space ground. When viewed in plan, the designer can see how the placement of building figures begins to form spaces out of the ground.

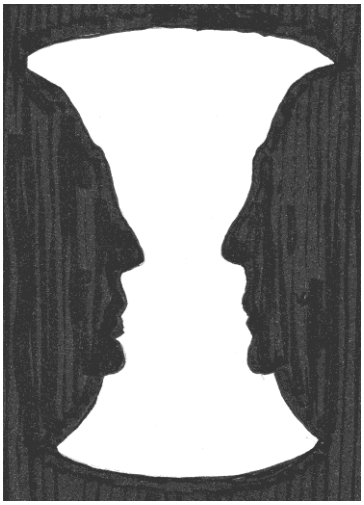


figure 3.3 This illustration, known as Rubin's vase, shows the concept of positive and negative space and how they can be reversed. Based on whether the viewer is interpreting the black or white portions of the image as the negative space, this is either an illustration of two faces looking at one another or of a vase.

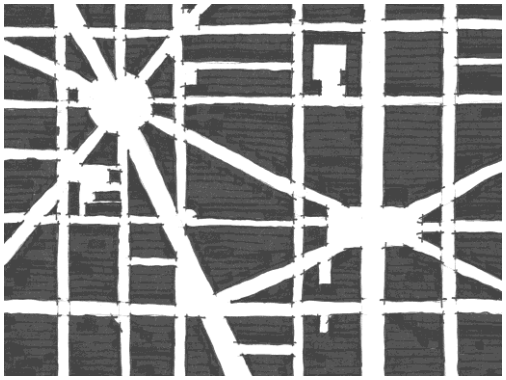


figure 3.4 When mapping out spaces with figure-ground drawing, it is impor- tant to observe how the positive space figures create spaces out of the negative space ground. These spaces, having forms of their own, are considered positive space.

Indeed, the formation of such spaces in figure-ground drawings is as important as the placement of the figures themselves (Figure 3.4). According to architectural designer Matthew Frederick, spaces formed by arranged figures become positive space in their own right, since they now have a form just as the figures do. From an urban design standpoint,

these framed spaces are often squares, courtyards, parks, nodes, and other meeting areas where people can "dwell," while remaining negative spaces are for people to move through.

Frederick also points out that when utilizing figure-ground, both figural elements and spaces can be *implied*, either by demarcating a space with structural elements or by creating negative spaces that resemble the form of nearby figures (Figure 3.5). This echoes theoretical neuroscientist Gerd Sommerhoff, who, as quoted by architect Grant Hildebrand, said:

> The brain expects future event-and-image sets to be event-and- image sets previously experienced. When repetition of previous experience seems likely, the brain readies itself to reexperience the set. If expectances are confirmed, the model is reinforced, with a resultant sensation of pleasure.

In this way, we can see how figure-ground becomes a powerful tool for level designers to create additive and subtractive spaces within many game engines. Many engines allow for the creation of additive figure elements to be arranged within negative 2D or 3D space. Gamespaces are often based on mechanics of movement through negative space, using positive elements as ledges or supports for a player's journey. Under other mechanics, forming spaces in-between solid forms allows for the creation of rooms, corridors, and other spaces that players can run, chase, and hide in. Additionally, designers can communicate with players via implied

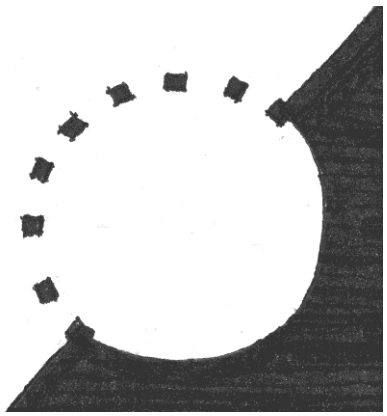


figure 3.5 These illustrations show how figure-ground arrangements can be used to imply spaces or elements.

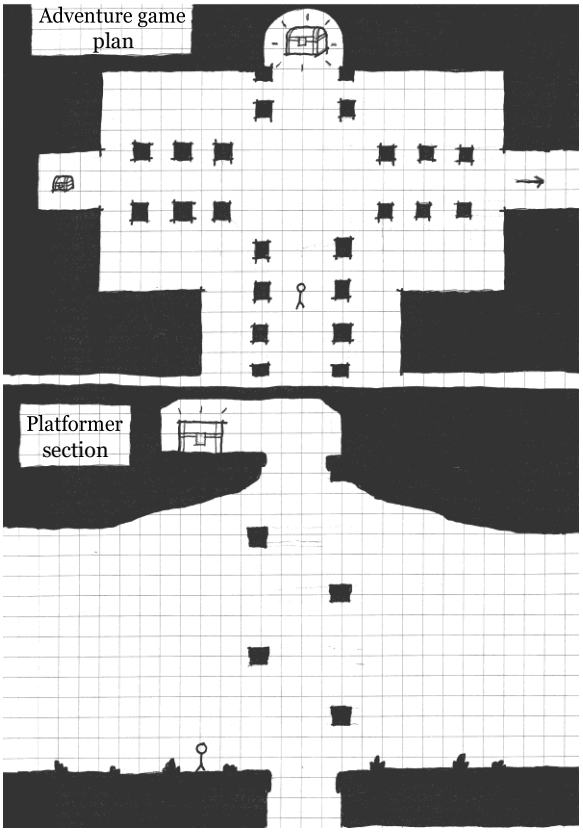


figure 3.6 These illustrations show ways that figure-ground relationships can be utilized in many gamespaces, implying spatial relationships can be an effective way of relaying spatial messages to players.

boundaries or highlighted spaces that use figure-ground articulations like those described by Sommerhoff (Figure 3.6).

form-void

Form-void (also called *solid-void*) is in many ways a three-dimensional evolution of figure-ground. It is the natural application of figure-ground in games where the gamespace will be viewed from a non-top-down perspective (Figure 3.7). In form-void theory, spaces that are carved out of solid forms are implied to have a form of their own.

Just as figure-ground is spatial arrangement by marking off spaces with massive elements, form-void is spatial arrangement by adding masses or subtracting spaces from them. This further resembles the operation of many of

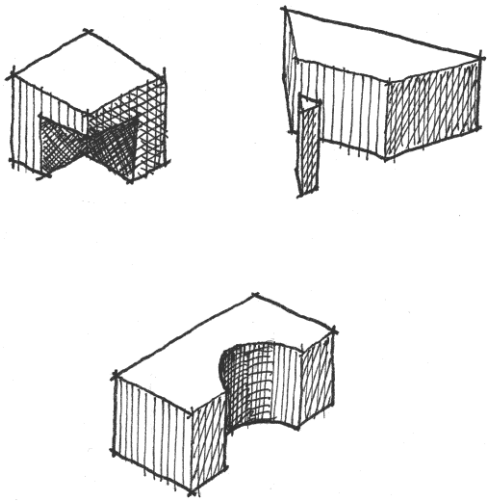


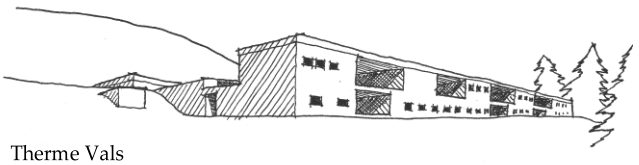
figure 3.7 Some examples of form-void relationships between forms.

the game engines described in Chapter 2, "Tools and Techniques for Level Design," in how these engines allow for the placement of geometric forms or for their carving out of an endless mass. Similarly, 3D art programs allow for intersections between forms to be realized through either careful modeling or *Boolean operations*, where mathematical equations are used to combine 3D models in additive or subtractive ways. Buildings such as Peter Zumthor's Therme Vals or Mario Botta's Casa Bianchi, both in Switzerland, show how form-void relationships can be used to carve out spaces for balconies, door- ways, windows, private rooms, and other functions (Figure 3.8). In games, such additions and subtractions can be used for hidden alcoves, secret pas- sages, sniping spots, or even highlighted level goals.

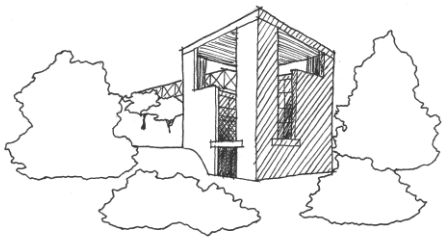
Arrivals

As we have already seen, level design is an art of contrasts. It is also an art of sight lines, pathways, dramatic lead-ups, and ambiguity about the nature of where you are going. All of these elements contribute to the experience of an *arrival*, the way in which you come into a space for the first time.

Much of how we will communicate with the player is through arrivals in space. It is also in how that space ushers the player toward his or her next destination or provides the means for the player to choose his or her own path. Much of how you experience a space when you arrive



Therme Vals



Casa Bianchi

figure 3.8 Sketches from Therme Vals by Peter Zumthor and Casa Bianchi by Mario Botta show how forms and voids can be used to define space.

in it comes from the spatial conditions of the spaces that preceded it: if you are arriving in a big space, spaces leading up to it should be enclosed so the new space seems even bigger, light spaces should be preceded by dark, etc. In their book *Chambers for a Memory Palace*, architects Donlyn Lyndon and Charles W. Moore highlight John Portman & Associates' Hyatt Regency Atlanta hotel as featuring such arrival in its atrium space. Dubbed the "Jesus Christ spot" by critics, it was not uncommon soon after the hotel was built for businessmen to arrive in the twenty-two-story atrium from the much lower-ceilinged spaces preceding it and mutter "Jeesus Christ!" as they looked upward. Similar spatial experiences are common in exploration-based games such as those in *The Legend of Zelda* or *Metroid* series for leading up to important enemy encounters, item acquisitions, or story events (Figure 3.9).

Another important element of how players arrive at spaces is their point of view from the arrival point. As we will see later in the chapter, camera angles in games have a great deal of influence with how a player understands space. However, dramatic reveals and arrivals are possible regardless of the chosen point of view. In classical architecture, the procession-like approach to the Parthenon in Athens, Greece, shows how an occupant's point of view is steered toward dramatic reveals. Visitors climbing up the steps of the Acropolis would first see the Parthenon from below. Then, passing through

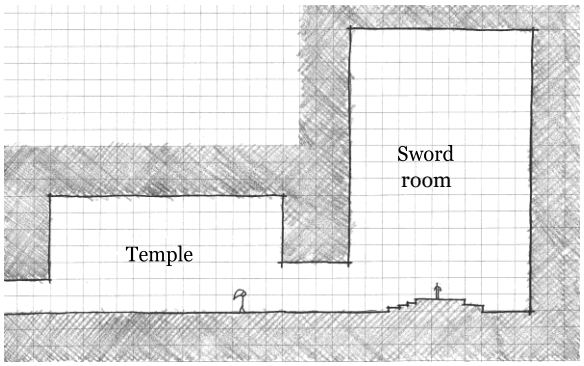


figure 3.9 Many games use contrasting spatial conditions to highlight the approaches to gameplay-important spaces such as boss rooms or goals. This dia- gram of the Temple of Time from *The Legend of Zelda: Ocarina of Time*, where the player receives a narrative-important sword, shows how contrasted spaces and a Byzantine-esque basilica plan emphasize the importance of the sword chamber.

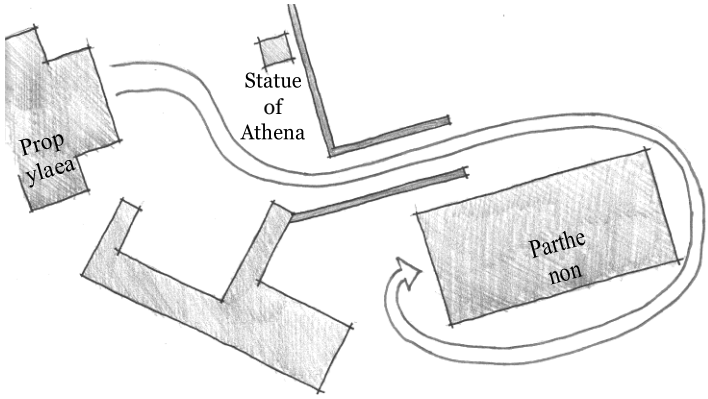


figure 3.10 Diagram of the entry procession to the Parthenon. Visitors did not approach from the entryway side, but from a corner. They then had to walk around the building. Since all elevations of the building were equally intricate, it could be enjoyed from all sides as visitors walked around to the entrance.

the Propylaea, the portico-like entrance building of the Acropolis, they would be greeted by a three-quarters view of the Parthenon from its north- western corner rather than a more two-dimensional view from straight on. The path then forced visitors to walk around the building before they would wind back to the entrance of the Parthenon itself. From this forced path, visitors got a more theatric approach to the Parthenon than if they had walked straight up to its entrance (Figure 3.10).

Genius Loci

A last architectural spatial lesson is less of an arrangement and more of another goal for designing your own spaces. This lesson is known as *genius loci*, also known as *spirit of place*. This term comes from a Roman belief that spirits would protect towns or other populated areas, acting as the town's *genius*. This term was adopted by late-twentieth-century architects to describe the identifying qualities or emotional experience of a place. Some call designing to the concept of genius loci *placemaking*, that is, creating memorable or unique experiences in a designed space.

In Chapter 2, we discussed the *Nintendo Power* method of level design, where the designer creates a macro-scaled parti or plan of his or her level, and then distributes highlighted moments of gameplay as though developing a map for a game magazine. Each of these highlighted moments of gameplay— be they enemy encounters, movement puzzles, or helpful stopping points— has potential for its own genius loci. Are these places for rest or for battle? Should the player feel relaxed, tense, or meditative in these gamespaces? The answers to these questions depend highly on the game you are building, but can help you determine the kind of feel you want for your levels.

Beyond individual gameplay encounters, level designers can implant genius loci within the entirety of their gamespaces and use it as a tool for moving players from one point to another. Genius loci can be built through manipulations in lighting, shadows, spatial organization, and the size of spaces, which will all be discussed in detail later in the book. If you are building a level for a horror game, for example, the genius loci you build should be one of dread, created through careful selection of environmental art, lighting, sound effects, and other assets. Spaces in a game with little or no genius loci can be *circulation* spaces, that is, spaces for the player to move through to get to the next destination. Depending on the gameplay you are creating, circulation spaces may be a chance to rest between intensive encounters or tools for building suspense before a player gets to the next memorable gameplay moment.

Now that we have discussed a few more general spatial concepts, we can move on to exploring some historical gamespace archetypes. These will allow us to take the tools and techniques we have learned thus far and employ them in classical gameplay structures.

HISTORIC GAMESPACE STRUCTURES

Many games and puzzles have been inspired by spaces described in classical literature or built in to historic sites. Beyond defining a specific spatial condition of a game environment, they serve as important models for how game worlds can be structured: linearly, branching, or interconnected.

Labyrinth

The first of these spaces is the classical *labyrinth.* According to Greek legends, the Labyrinth was built by the architect Daedelus to hold the half-man half-bull Minotaur for

King Minos of Crete. Representations of labyrinths in art dating as far back as the Roman Empire depict labyrinths as winding passages that loop around themselves, eventually reaching an endpoint (Figure 3.11). While labyrinths are often confused with branching mazes, artists and writers such as Hermann Kern have made the distinction that classic labyrinths are *unicursal*—consisting of a single winding path. Labyrinths are also notable for their use as a floor pattern in many medieval churches, such as Chartres Cathedral, where walking the path of the labyrinth was a meditative experience.

Labyrinths are an important model for understanding gamespaces that are navigated in a linear fashion. As Salen and Zimmerman point out, games are often the least productive way to accomplish a task. Labyrinths also demonstrate that even in linear gamespaces, both literal and gameplay twists, turns, and challenges can add interest to an otherwise straightforward pathway. Beyond singular levels, many games are themselves labyrinthian, requiring players to follow one set path of events. Such a structure is useful for games where an embedded narrative, theme, or argument is being communicated to the player.

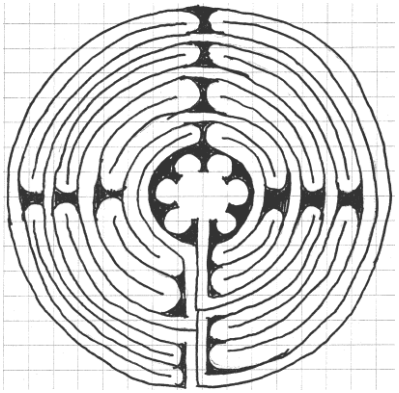


figure 3.11 An illustration of a classical labyrinth.

Maze

Often confused with unicursal labyrinths, *mazes* are branching spatial puzzles where occupants and players must find their way through an elaborate structure of walls and pathways with multiple dead ends to find an exit point (Figure 3.12). Due to their branching nature, mazes are said to be *multicursal*, having more than one defined path. Despite the name, the legend of the Minotaur and the Cretan Labyrinth actually describes a maze—thus the current popular interchangeability between the terms *maze* and *labyrinth*. Upon finishing the structure, Daedelus is said to have nearly gotten lost among its many branching paths. Thus the hero Theseus utilized a ball of thread to remind himself of the way out during his mission to kill the Minotaur.

From the Renaissance through the nineteenth century, architects also developed *hedge mazes*, multicursal pathways through tall bushes in the gardens of large estates. Originally unicursal labyrinths, these structures evolved into branching paths that often contained several points of inter- est. Of note is the Labyrinth of Versailles, within which explorers could find thirty-nine sculptures depicting Aesop's Fables (Figure 3.13). The PC indie title *Slender: The Eight Pages* uses a similar layout, where players must navigate a maze of pitch-black forest pathways to find notebook pages before they are captured by a malicious entity (Figure 3.14).

Mazes, and even recreations of European-style hedge mazes and their American derivative, corn mazes, are a very common spatial type in games. Their branching nature with potential dead ends implies a rich *risk-reward* structure, where the game asks you to weigh different uncertain options with the hope of choosing an advantageous answer. In terms of game mechanics, maze levels of games are often paired with features such as powerful enemies or time limits to create dramatic gameplay situations (Figure 3.15).

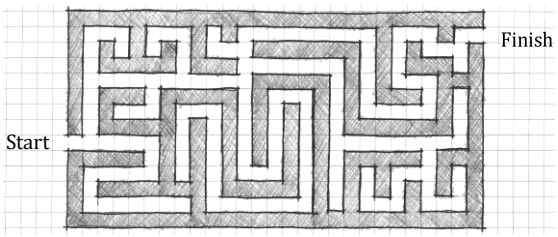


figure 3.12 An illustration of a maze.

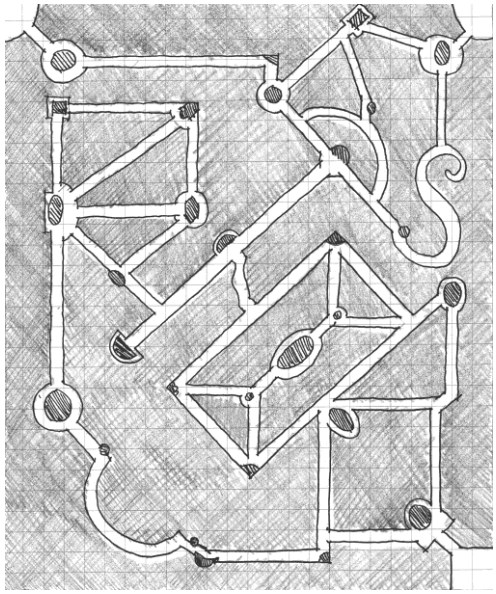


figure 3.13 A plan of the Labyrinth of Versailles showing the many branching paths.

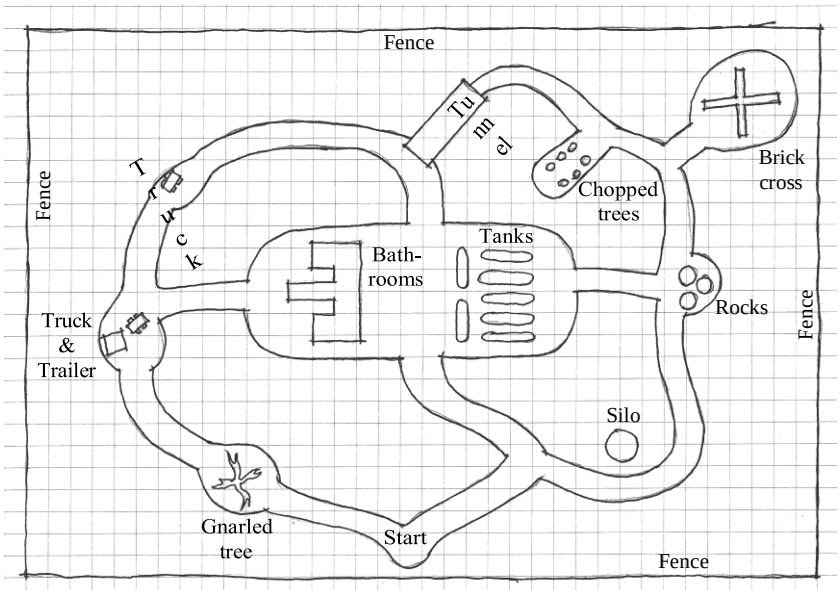


figure 3.14 A map of the forest in *Slender: The Eight Pages*. Notice that it has a similar layout and node-based structure for places where players may find the titular pages.

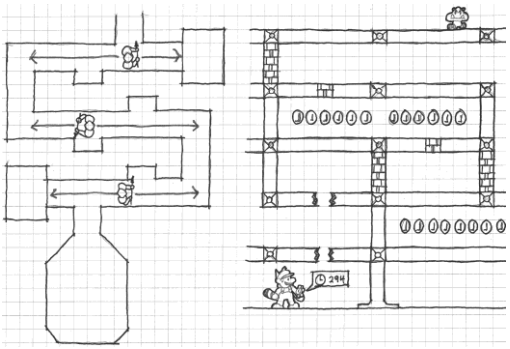


figure 3.15 Two examples of in-game maze levels from *The Legend of Zelda: Ocarina of Time* and *Super Mario Bros 3* show how designers use mazes to complement dramatic elements such as powerful enemies (*Zelda*) or a time limit (*Mario*).

The dead ends in mazes do not always have to be negative. Many games with explorable dungeons, such as *Final Fantasy* or *Zelda* titles, use branching paths and dead ends as incentives for exploration. Often these explorable branches yield treasure or other rewards. Games with even simpler worlds can also utilize small branching paths, such as in the previously mentioned mobile game *SWARM!*. Within levels of this game, small diversionary paths off of a level's typical route can lead to caches of coins and other rewards (Figure 3.16).

rhizome

While *maze* and *labyrinth* are architectural terms, *rhizome* is a term from botany. Rhizomes are networks of roots formed by underground stems of plants. This term was borrowed by philosophers Gilles Deleuze and Félix Guattari for their two-volume work *Capitalism and Schizophrenia*. As a philosophical concept, rhizomes describe a lateral representative structure of information and data without distinctive entry and exit points. At the beginning of *A Thousand Plateaus*, Deleuze and Guattari outline the guide- lines of a rhizome, the most important of which, for our purposes, is that every point in them is connected to every other point at the same time (Figure 3.17). In this regard, the term *rhizome* has been used to describe the Internet, as users can access information on any website from any other website by typing in its Uniform Resource Locator (URL).

Spatially, the term *rhizome* can apply to any place that can be instantly traveled to from any other place. In the real world, air travel allows this

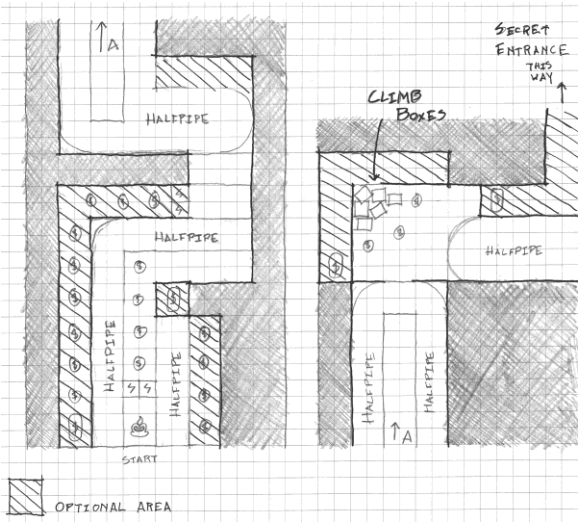


figure 3.16 A plan sketch of level 1-3 of *SWARM!* showing small passageways off of the main level path. While not traditionally maze-like, these branching paths demonstrate in a small game the same methods for creating player curiosity found in much more complex titles.

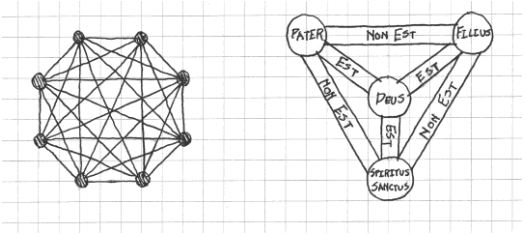


figure 3.17 A diagram of a rhizomatic structure. Mathematically, these are referred to as *complete graphs*, where all vertices on a geometric object connect to all other vertices. These kinds of structures are often used in religious iconography, such as the Christian shield of the trinity (also pictured).

to an extent. In games, a popular mechanic in large adventure games is to give players access to an instant transportation function that allows distances to be traveled quickly. In *Pokémon*, for example, players eventually gain an ability that allows bird Pokémon to transport them to places they have already visited. This ability also exists in many games in *The Legend of Zelda*, *Final Fantasy*, and *Elder Scrolls* series to help players manage travel over large in-game landscapes.

ActiveWorlds, *Second Life*, and other large virtual worlds have similar functions, but make them part of the user's standard moveset by allowing him or her to type in coordinates of where he or she would like to go. In *ActiveWorlds*, this has turned locations along the x and y axes of the world map, such as points (45, 0) or (0, 45), as well as points along the center diagonal between the two, such as (45, 45), into major commerce and development thoroughfares since they could be traveled to and remembered easily. Likewise, in *Second Life*, the interior of the Museum of the Globe can only be accessed through *Second Life*'s coordinate system—further making it a piece of architecture that can only exist within a virtual world. The ability of game developers to script such options into games makes rhizomes a unique option for creating world logic and geometry within digital games.

Now that we understand spatial types that can describe the structures of both single levels and entire game worlds, we can discuss how even more micro-scaled portions of levels can engage users emotionally. For this next section, we look particularly at the sizes of gamespaces and discover how they affect a player's relationship with a space.

SPATIAL SIZE TYPES

While size distinctions for gamespaces seem like rather banal information, they actually create some very interesting emotional scenarios in game levels. Here we discuss three size types that level designers can use to create their levels. These types can be used in a variety of gameplay scenarios, such as contextual tutorials and creating drama through survival scenarios.

Narrow Space

The first size type we will discuss is *narrow space*, a spatial condition where the occupant feels confined and unable to move. When considering the measurement techniques highlighted in Chapter 2, narrow gamespace is that which is not much larger than a player character's own size metrics—often with space for only two of such a character to stand in a passageway (Figure 3.18). Narrow space is a significant spatial type in video games that can be used for a variety of dramatic or skill-based gameplay scenarios.

Narrow spaces create tension by giving space *scarcity*, limited amounts such that space itself becomes a valuable resource. Under this model, *conflict* can rise from players' drive to keep space for themselves from other

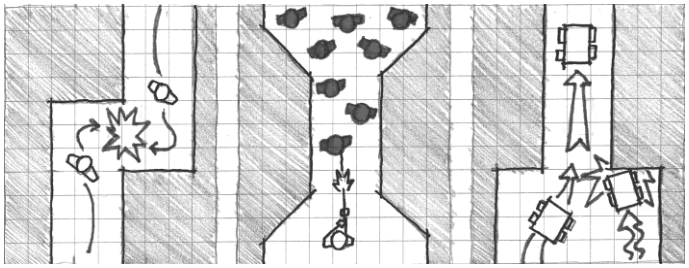


figure 3.18 Plan diagrams of narrow space. These examples show how narrow spaces can be used to create conflict scenarios among players and NPCs.

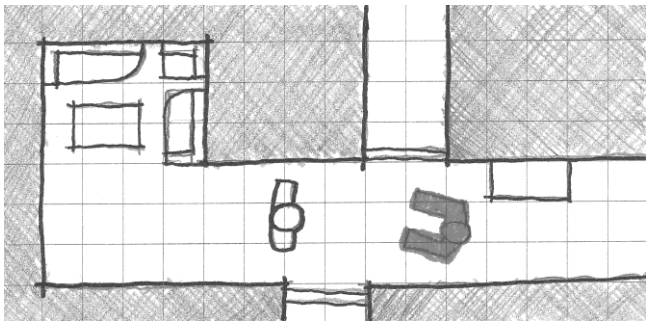


figure 3.19 Diagram of a typical hallway space in *Resident Evil*'s Spencer Mansion. The narrow hallways create a claustrophobic environment. This causes enemy encounters to be a significant threat, as the player is less able to move around them.

players or non-player characters (NPCs). In player vs. player conflicts, narrow space can be used to create bottlenecks for creating ambushes and traps or to provide tense "threading the needle" moments in racing games.

The narrowing of space close to the limits of player metrics creates a sense that the player cannot perform many of the actions he or she could under other conditions. This is significant for the other function of narrow spaces—evoking vulnerability by limiting player movement options. This is a common design feature of many horror games such as *Resident Evil*, where the hallways of the Spencer Mansion combined with the game's non-intuitive "tank controls" create a heightened sense of claustrophobia
(Figure 3.19).

Stealth games also use narrow space in interesting ways. Games in the *Metal Gear Solid* series offer a plethora of spaces to hide in, but while some comfortably allow hero Solid Snake to scout out his next hiding

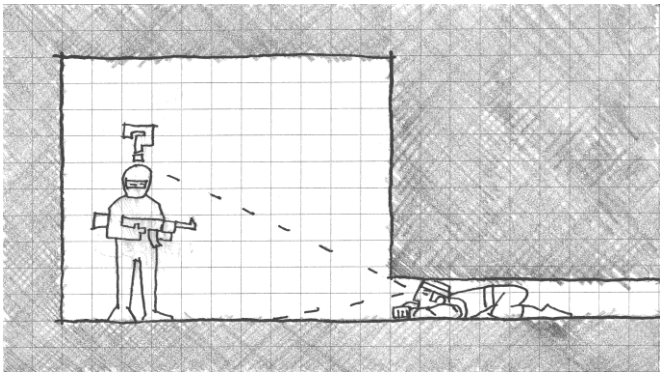


figure 3.20 Narrow spaces in *Metal Gear Solid* games offer concealment from enemies, but at the cost of both mobility and visibility.

spot, others, such as lockers, vents, or crawl spaces, limit both Snake's mobility and the player's ability to see what is around him (Figure 3.20). This feature of many stealth games reinforces the idea that in stealth games, as in horror games, player characters are often weaker than their opponents.

intimate space

The next size type is known as *intimate space*. Intimate spaces are neither confining nor overly large and are, in fact, what one might call *metric appropriate*, at a size that comfortably supports the size and movement metrics of player characters (Figure 3.21). Within intimate spaces, interactive surfaces or features are within reach of a player character's inherent abilities. In some games, the amount of space described in this way may change if the abilities of player characters can expand through additions such as high-jump capabilities or others.

A great deal of gamespaces could be described as intimate space. In corridor shooters and in multiplayer arenas where players are on even ground with no significant vantage points above or below, the gamespace can be considered *multilateral intimate space* (Figure 3.22). In multiplayer situations, intimate spaces create a spatially even playing field shared by multiple actors. Player skill notwithstanding, no player has an advantage over any other. Racing game tracks with wide enough road space for multiple cars allow players to compete against one another for race position rather than track space. In these situations, contrasting narrow and inti- mate spaces creates interesting gameplay situations and allows players to build strategies of how to proceed.

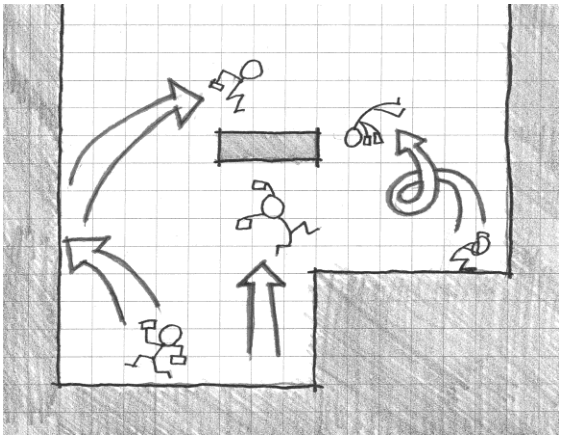


figure 3.21 Intimate spaces are ones where everything within the space is accessible by the player character with its inherent abilities.

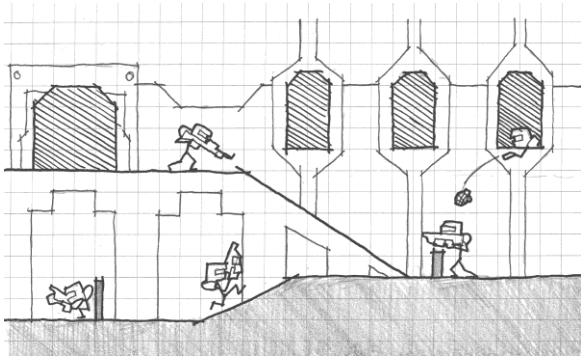


figure 3.22 This sectional diagram shows multiplayer shooter characters battling within an intimate space arena. Architectural features like ramps, slight elevation changes, and occasional barriers do not interrupt the spatially even playing field of the level.

Intimate spaces in single-player games can have several beneficial effects. Due to their comfortable accessibility, they are often "friendly" locations within the plot of a game. Princess Peach's Castle from *Super Mario 64* is an intimate space because the player can access many of the platforms inside without putting Mario at any significant risk. There are no pits or enemies to endanger the character and end the game. This space and others like it also act as a *tutorial space* for the game, allowing players to experiment with Mario's abilities at their own pace.

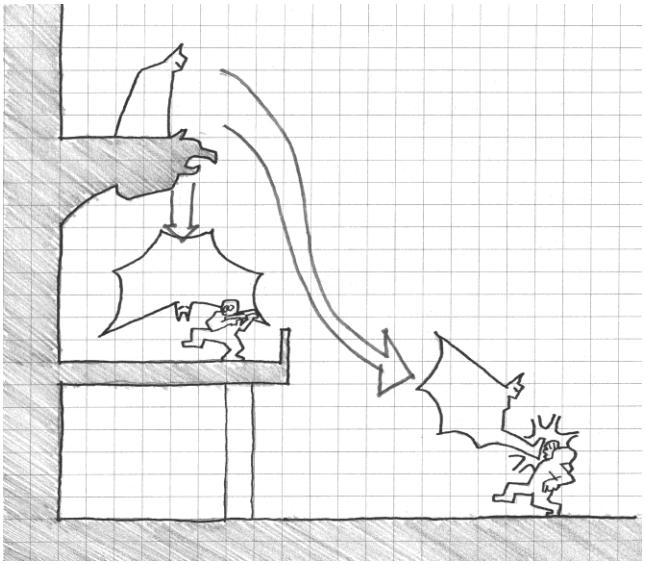


figure 3.23 Intimate spaces in *Batman: Arkham Asylum* involve the use of vantage points and sight lines that are accessible through the abilities of the player character, Batman. These abilities allow for greater use of the level space by players than enemies, so intimate space in this case provides spatial advantages for this single-player experience.

One game series that utilizes intimate space in interesting ways is the *Batman: Arkham* series. For the first game in the series, *Batman: Arkham Asylum*, developer Rocksteady coined the term *predator gameplay* to describe the game's stealth hunting. As a contrast to typical stealth games where the protagonist is somehow weaker than the enemies, the developer argued, Batman would be stronger and have better command of his surroundings, similar to his capabilities in the *Batman* comic books. To complement Batman's abilities of gliding, grappling, and silently taking down foes, the level designers created level spaces that enabled these actions, with high vantage points and sight lines that allowed the player to capitalize on Batman's unique abilities (Figure 3.23). Unlike multiplayer games, where the focus of intimate space is to create comfortable spaces for many players, single-player games can utilize intimate spaces to give players an advantage over foes.

Prospect Space

At times, games put players in the positions that Batman's foes in *Arkham Asylum* find themselves in: wandering through a large open space and open to attack. This third spatial size type is known as *prospect space* (Figure 3.24). Hildebrand describes prospect space as that in which humans had to historically find food, water, and other necessities—outside of the safety of caves and open to predators and the elements.

Prospects in gamespaces take many forms. Once again looking to the multiplayer map, prospects are found in any area where one player may take a spatial advantage over another, such as by having a vantage point from above. In single-player games, prospects are used as *boss rooms*: large open spaces where the player cannot use his or her abilities to take a spatial advantage but must instead fight a single powerful foe. Such spaces are used regularly in the *Mega Man* game series, where players must finish each level by battling a powerful Robot Master (Figure 3.25).

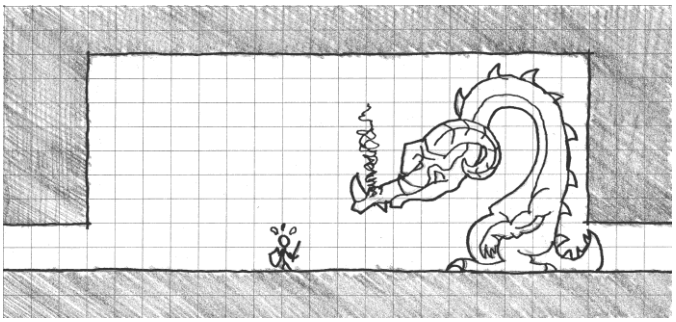


figure 3.24 This illustration shows a basic idea of how prospect space operates in terms of a player's openness to enemy attack.

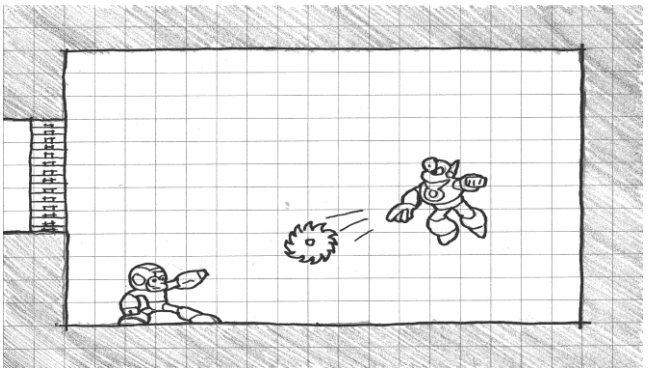


figure 3.25 Boss rooms in the *Mega Man* series are often large and open so players must directly deal with the attacks of foes.

Prospect spaces are similar to narrow spaces in their potential for creating fear in the player. They do so through opposite means, however. If narrow spaces create a sense of claustrophobia, prospects create a sense of *agoraphobia*, an anxiety disorder that includes a fear of wide-open spaces. While there may be a general sense of vulnerability in prospect spaces of a multiplayer deathmatch map, this feeling can be heightened through the use of fog, music, shadows, and other atmospheric effects related to the forming of your gamespace's genius loci. *Slender: The Eight Pages*'s entire environment is a prospect draped in pitch-black darkness, heightening the sense that the malevolent Slender Man has mastery of the gamespace and is

waiting just beyond the player's field of vision. His artificial intelligence (AI) is scripted in such a way that he will randomly appear to the player at varying distances and move closer when the player is looking away (Figure 3.26). As such, Slender Man's movements across the prospect space give the impression that he is supernatural and can move great distances quickly. To put this in terms of movement metrics: the space is built to enhance Slender Man's metrics while it makes the player's own movement metrics seem agonizingly slow.

Prospect spaces and the other spatial size types are much more complex beyond the qualities listed here. In later chapters, we discuss how they are

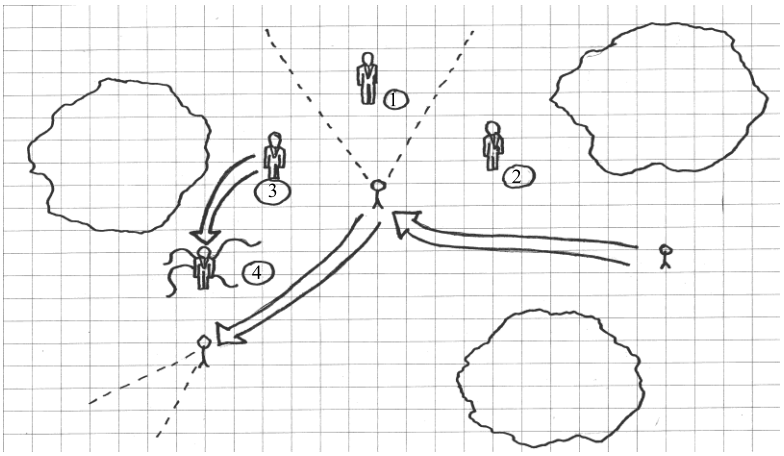


figure 3.26 In *Slender: The Eight Pages*, the antagonist spawns randomly around the player, demonstrated in this plan diagram, giving the impression that he has complete control over the pitch-black prospect space (locations 1, 2, and 3 on the diagram). If the player turns away, the antagonist quickly pursues and further gives the impression of great speed (location 4).

mixed and matched with other types of spaces to create dramatic spatial articulations. Next, however, we explore a spatial type that connects the singular spatial atoms that we have thus far discussed.

MOLECULE LEVEL SPACES

Now that we have discussed several isolated gamespace types, we need to understand how to link these spaces together in interesting and meaningful ways. Designers Luke McMillan and Nassib Azar, who is himself a former architect, in their Gamasutra article "The Metrics of Space: Molecule Design," highlight a methodology for spatial organization based on the arrangement of gamespaces, how players reach one from another, and how designers can allow or disallow

access between them for interesting play scenarios. Based on interpretations of mathematical graphing theory, which we delved into briefly during our discussion of rhizomes, they call this methodology *molecule design*. In this section, we discuss the basics of molecule design and adapt it to the architectural concepts we have explored thus far.

The Basics of Molecule Design

McMillan and Azar's concept of molecule design is primarily focused on the relationship between play spaces, treated in their graphs as *nodes* and *edges*. Nodes are the play spaces themselves—areas with significant enemy encounters, item pickups, spawn points, or opportunities for action. Edges describe the relationship between these spaces, be they visual or spatial (as in you can travel from one to another). One addition implied in McMillan and Azar's article is that of *visual language*, that we can formally add for our purposes to the diagrams to dictate what the proximities between nodes and the size or nature of your edges mean. In Figure 3.27, dotted lines show that spaces are viewable from one another, and solid lines show that you can move from one to another. Arrows on the solid lines show if spaces are one way, and thick lines show that spaces between the nodes are direct paths. Level plan and section drawings are included to show a level space that may be designed from such a molecule.

This methodology greatly resembles the *Nintendo Power* method dis- cussed in Chapter 2, but engages spatial design on a more conceptual level. It is important to note that the shapes of these molecules are not necessarily the layout of the level, but a description of how spaces interact with one another. To demonstrate this, Figure 3.28 shows another set of level drawings that can be derived from the molecule diagram in Figure 3.27.

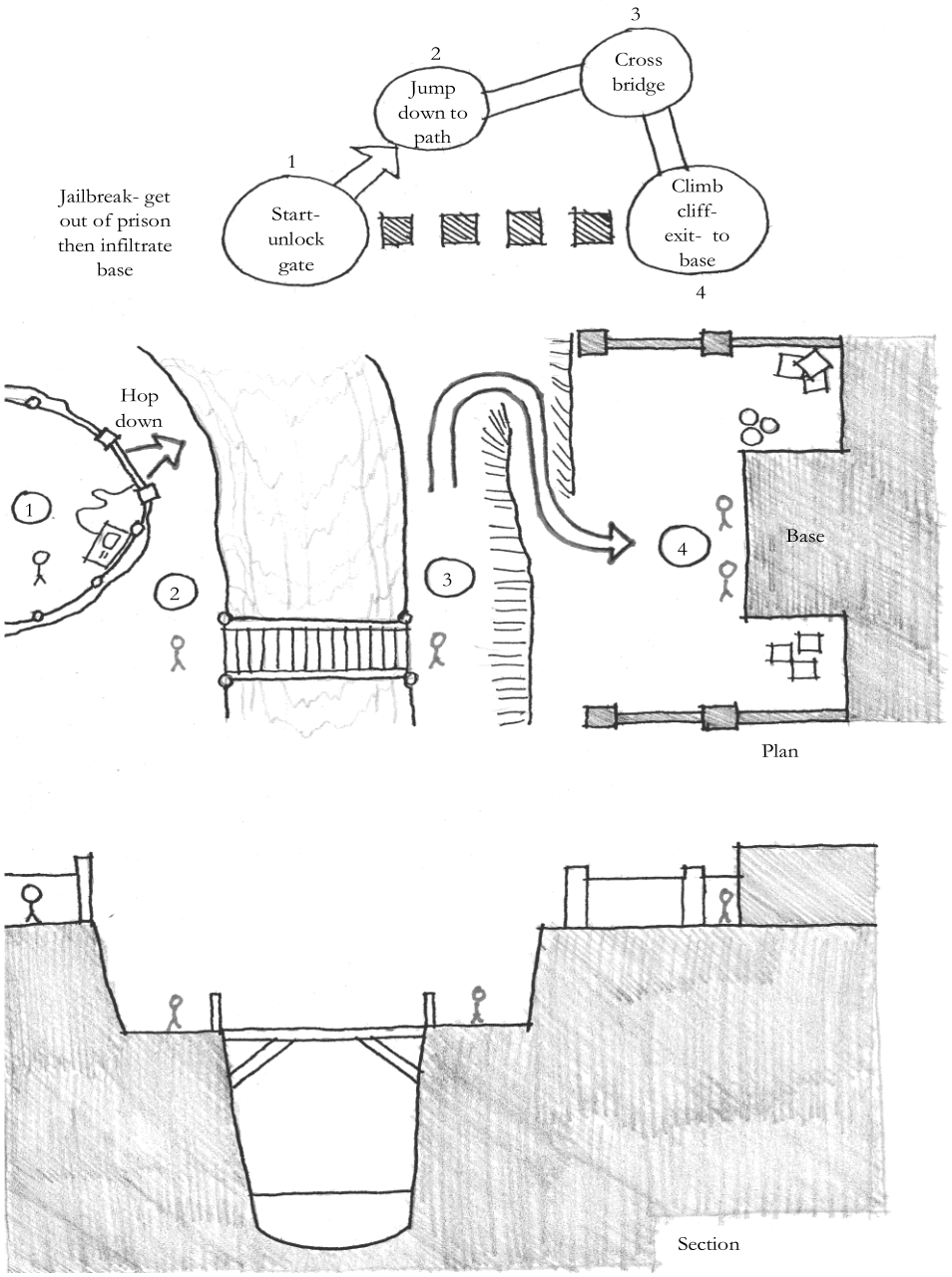


figure 3.27 This molecule diagram establishes links between nodal gamespaces with the use of edges. A visual language has been established for edges to help describe elements of three-dimensionality as shown in the accompanying plan and section drawings of the level.

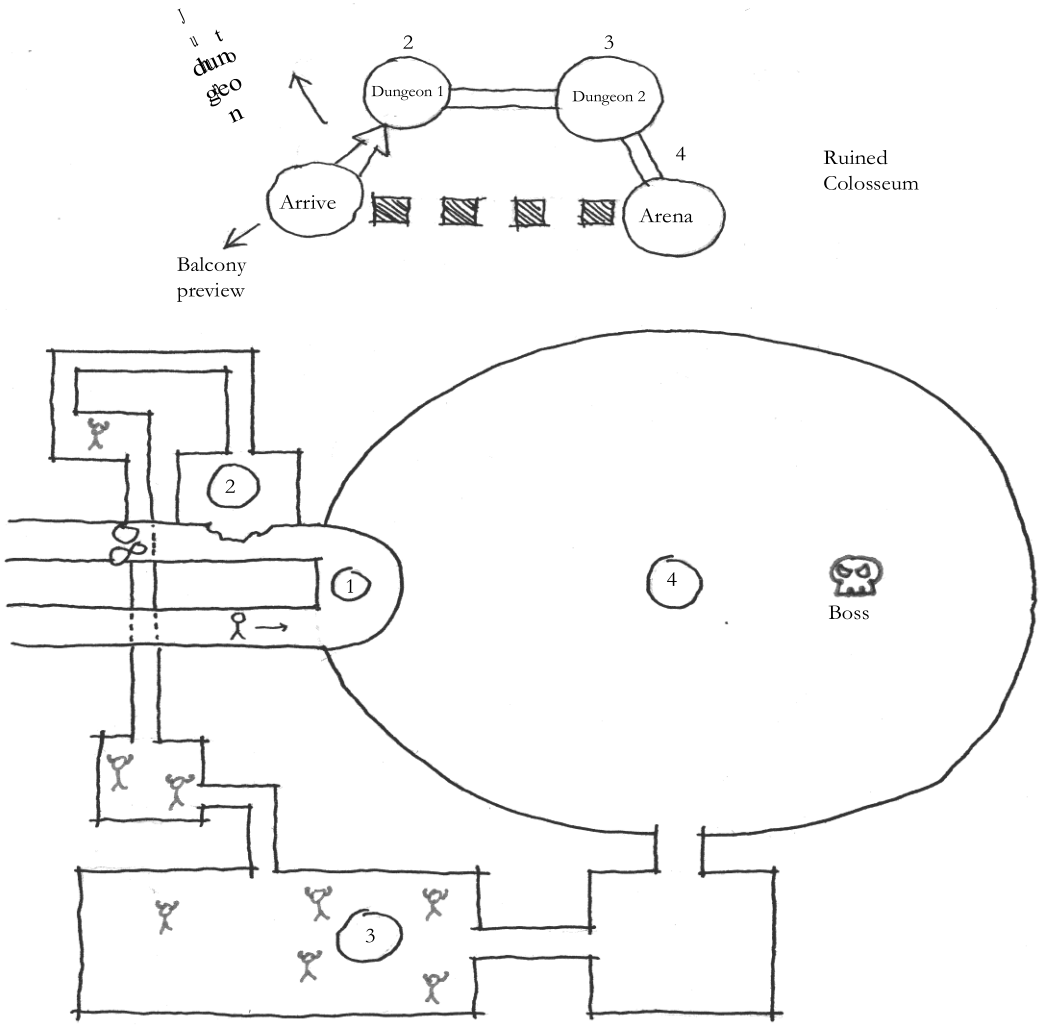


figure 3.28 This set of level drawings is derived from the same molecule diagram found in Figure 3.27. Molecules describe relationships rather than actual level space.

Understanding the abstract nature of molecule diagrams is important for utilizing McMillan and Azar's last important concept: *Steiner points*. In graph theory, a *Steiner tree* is a spatial puzzle where the player must find the shortest point between two lines, constructed from points labeled A, B, and C, where A connects to B, B connects to C, but C does not connect to A. In McMillan and Azar's example, the answer

to the puzzle is a slight cheat, where players can draw a node directly in the middle of the three that is connected to each. This is a Steiner point (Figure 3.29). Steiner points in level design can occur in any spatial scenario where a player may access play spaces vertically, that is, by climbing or jumping from a nodal gamespace to a Steiner point space, then into another nodal gamespace in the molecule diagram (Figure 3.30). Steiner points are essentially shortcuts in level paths. These can be utilized purely by jumping from high ledges onto lower

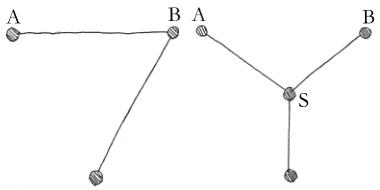


figure 3.29 This diagram shows the Steiner tree puzzle and the answer utilizing a Steiner point.

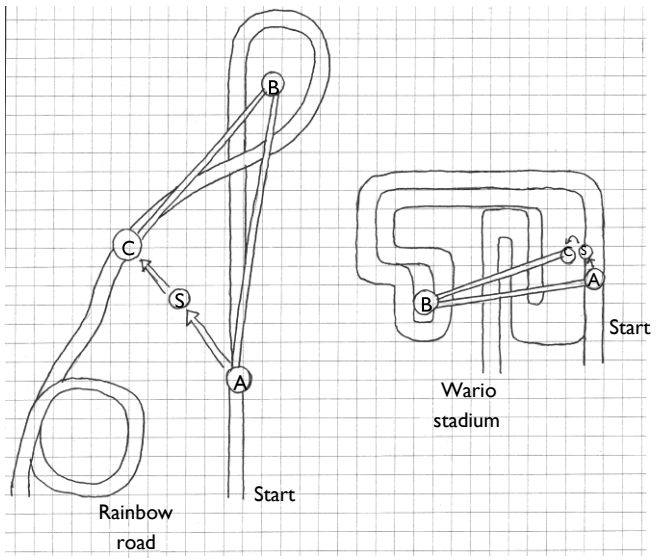


figure 3.30 Steiner points in level design may be used to conceptualize secrets, or shortcuts. These diagrams of tracks from *Mario Kart 64* show how Steiner points (and some considerable skill) may be employed to skip large portions of the game's two longest tracks.

ones to save time, or may even be incentivized with power-ups or other rare items.

Now that we have discussed the basics of McMillan and Azar's molecule design principles, we will see how we can further integrate them with our own architectural approach.

Spatial Types as Molecule Nodes and Edges

Molecule diagrams are very abstract. As such, they leave a lot of guess- work about what could be used as a significant gameplay node. We have already discussed many spatial principles that can be useful for defining these spaces. In the previous chapter, we established that in level design, form often follows core mechanics. Likewise, nodal gamespaces in your own molecule diagrams can represent areas where the player employs unique or intense applications of your core mechanics: big gun fights, sharp turns, boss battles, difficult platforming, etc. These nodes are also opportunities to emphasize the genius loci of your level. To once again use *Slender: The Eight Pages* as an example, each landmark in the wooded maze carries its own experience unique from the rest of the course. In the infamous bathhouse, for example, the normally prospect- structured space of the game world suddenly becomes a maze of narrow hallways where Slender Man could be around any corner. While the transitional edges between such landmark nodes allow for encounters with Slender Man, they ultimately shuffle players between more notable gameplay nodes.

Slender also demonstrates an important distinction of using spatial types as nodes. While the game itself is structured as a Versailles-esque maze, several of the nodes contain their own smaller maze spaces. The circulation spaces that bring players from one node to another may be very linear, as may the nodes themselves. In a level prototype based on Washington, D.C.'s, Sackler Gallery of Art, an underground museum with a downward-spiraling ramp system, the transitional spaces utilize the downward ramps to take players from one intense gamespace to another. In the more intense sections were either unicursal corridors that would use atmospheric effects or tight mazes for enemies, in this case zombies, to inhabit (Figure 3.31).

Molecule diagrams may also describe spaces where spatial size changes significantly. As described previously, size changes create their own special gameplay scenarios. McMillan and Azar pay special attention to *spawn points* in their article: the spaces where players begin a

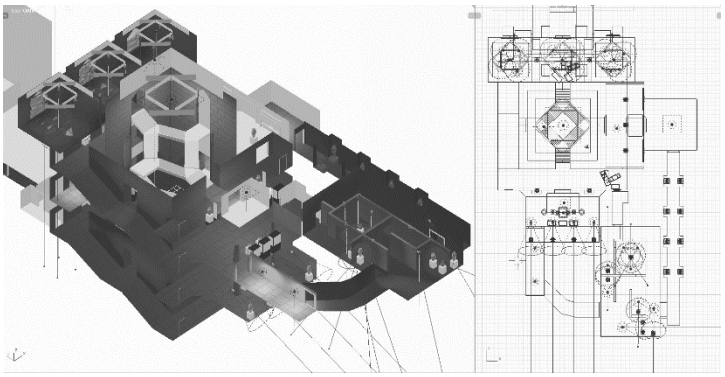


figure 3.31 This image of a prototyped level shows how transitional spaces (the downward spiraling ramps) may be linear, while the nodal gamespaces may follow their own linear or branching pathways on a smaller scale.

level or come back to life during multiplayer matches. These spaces may be large but intimate, allowing players to gather resources before rejoining battles. Likewise, transitional spaces may be equally inti- mate, keeping players on an even playing field when inside, but leading to large prospect spaces where players may gain spatial advantage over one another (Figure 3.32). In single-player games, where players can often better admire the designs of levels, transitions from intimately or narrowly scaled circulation to prospect spaces may not only describe changes in gameplay intensity, but also create their own "Jesus Christ spot" experiences.

If one reverses this dynamic, prospect-scaled transitional spaces allow for the generous usage of Steiner points. In the previous Sackler Gallery level prototype, the entire circulation space is a Steiner point that players may utilize within the limits of the player character's ability to fall from heights without taking damage. Alternatively, *Metroid Prime 2: Echoes* utilizes prospect/circulation spaces as challenges. The Steiner point ability to jump from higher levels to lower ones is used as an obstacle in sections where players must scale a set of platforms to progress in the game (Figure 3.33). Later, if the player is returning from the higher gamespaces, the Steiner point becomes a shortcut again.

In the next section, we explore another diagram type similar to molecule diagrams, though much less abstract. These diagrams will help us determine how to join related gameplay events already outlined for levels to one another.

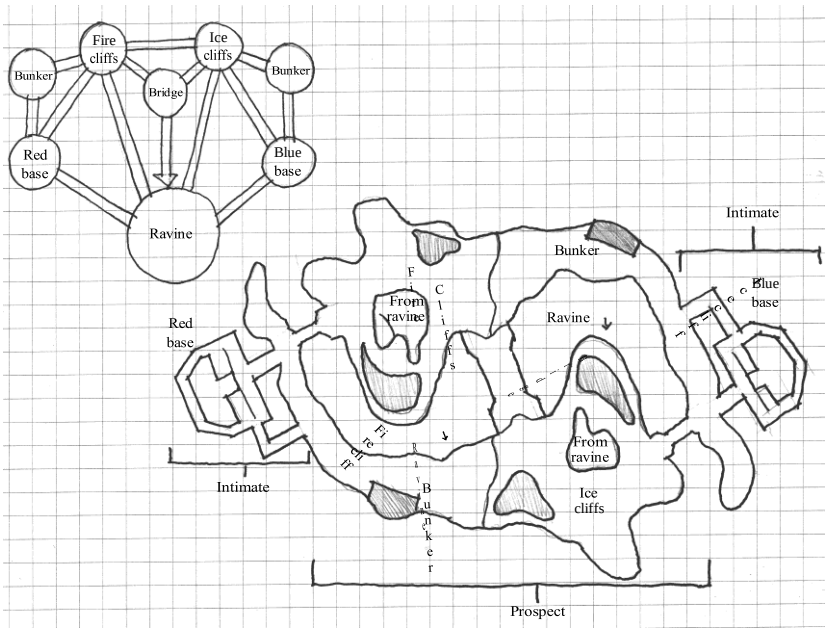


figure 3.32 This drawing and molecule diagram of a multiplayer map from *Halo 4* shows how players move from intimate hallway spaces into prospect nodes where they may gain strategic advantages over one another.

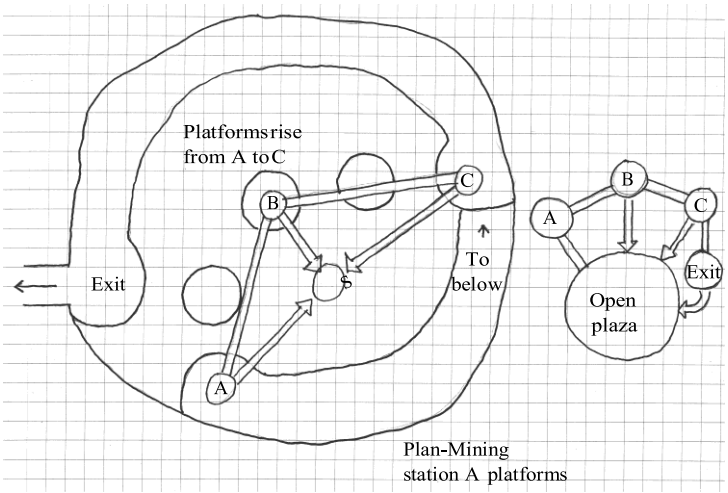


figure 3.33 This drawing of the Agon Wastes environment from *Metroid Prime 2: Echoes* and the accompanying molecule diagram show how Steiner points are used as obstacles: failure to jump to platforms where one may progress results in a return to earlier areas.

FORM FOLLOWS GAMEPLAY WITH PROXIMITY DIAGRAMS

When a property owner wants to build a building, he or she often outlines a *building program* to give to potential architects. The program is a list of necessary functions the building must perform and spaces the building must have. Similarly, in Chapter 2, we discussed how level designers begin their design with a vision of the types of gameplay experiences it should have. This form follows function approach allows us to relate our level designs to the mechanics of the games we are designing them for.

Molecule design diagrams, which we discussed in the previous section, are very similar to a diagram type that architects use to organize building program requirements into building spaces: *proximity diagrams*. Proximity diagrams, like molecule diagrams, are made up of bubbles and connected with lines. The bubbles represent rooms or spaces that are to be part of the building and are sized according to square footage requirements for these spaces. Likewise, lines connecting the bubbles are sized according to how important it is for them to be adjacent (Figure 3.34). Also like molecule diagrams, proximity diagrams are not actual spatial plans. They are a tool for analyzing the functional idea for a building, but should not be understood as its final spatial plan.[22]

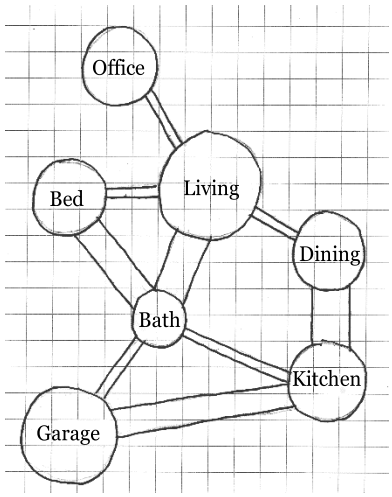


figure 3.34 A building proximity diagram. Each bubble is sized according to the required square footage of a space. The sizes of lines show the necessity of spaces being adjacent in the final building.

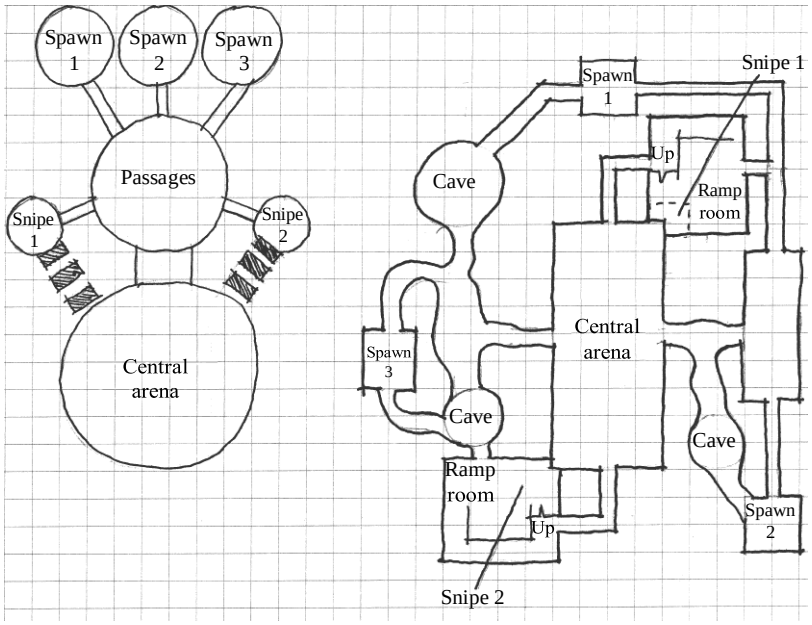


figure 3.35 A proximity diagram for a multiplayer first-person shooter (FPS) level. In this example, it is important for each sniper position to have a view of the main competition area for each spawn point to have access to gear. Despite the layout of the diagram, the final design can (and should) look drastically different.

Proximity diagrams can be used for level design as they would be used for real-world architecture. Rather than each bubble having the name or square footage for a functional building space, they have the names of gameplay spaces in them, such as boss room, sniping spot, or finish line. The sizes of these bubbles can stand for their size type. The sizes and type of line used to connect the bubbles can describe proximity priority and the type of connection spaces have. For example, it may be important for sniping positions to have a view of a large prospect space in a map, even if the player must actually travel a long set of corridors to get there (Figure 3.35). Now that we have looked at some methods for organizing spaces in levels, we will explore some common world configurations found in games to discover how they are organized for ease of use and enjoyment.

HUB SPACES

Beyond the spatial and organizational concepts already discussed, there exist other spatial types that deserve consideration. The first of these are *hub spaces.* Hubs are a type of intimate space where the player may

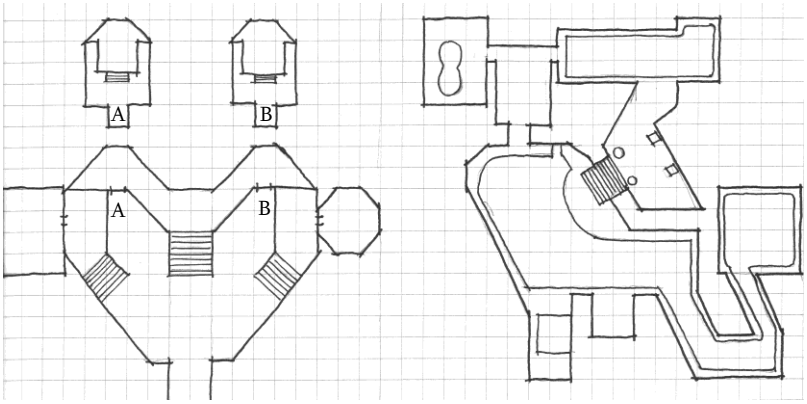


figure 3.36 Hub levels include spaces such as Princess Peach's Castle from *Super Mario 64* and Station Square in *Sonic Adventure*. They both lead players from environment to environment while allowing them to backtrack and freely explore.

access a game's different levels. Many hubs are non-threatening and offer players the ability to explore within the metrics of their character's abilities. Hubs distinguish themselves from other game world structures, such as sandboxes, which we discuss later, by separating levels from more intense gamespaces through the use of portals, doors, or some other device (Figure 3.36).

Hubs became popular in 3D games like *Super Mario 64* and *Banjo Kazooie* as a way to facilitate player travel between different environments. In this way, they are semi-rhizomatic: they offer a central point from which to jump from gamespace to gamespace. From a performance standpoint, these hubs allow levels to be loaded one at a time rather than create the level of seamlessness that one might expect in a large sandbox environment. Also, they offer a narrative "out" for games that wish to have characters' travel to themed worlds such as ice, volcano, jungle, etc. when it would otherwise be illogical.

From a gameplay standpoint, hubs are notable for how they manage player goals. Hub-based games are typically structured around collecting resources, gold stars, puzzle pieces, etc., that facilitate travel through the game world and unlock portals. As players complete more intense gameplay challenges, they collect more of the unlocking resources and can access new levels. While hub-based games offer an overall labyrinthine model through the general order in which one engages levels, they also offer great freedom to players in determining what missions to take, when and if to backtrack, or how long they wish to explore each level (Figure 3.37).

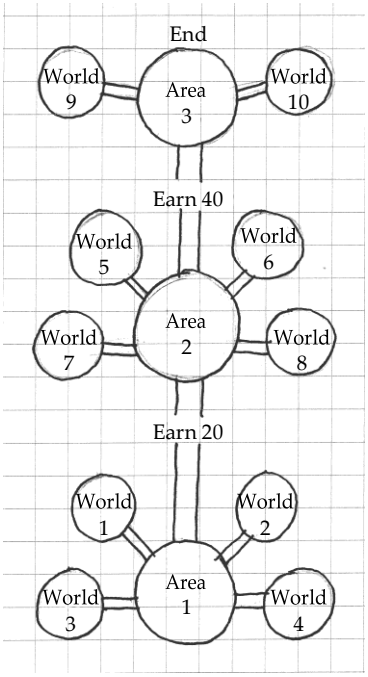


figure 3.37 This diagram shows how hub-based games are typically structured. They represent a ladder of sorts where the overall journey is linear, but the activity of how to overcome each rung is largely determined by the player.

In many ways, hubs offer the best of both linear and open styles of gameplay. In the next section, we will explore another type of space that offers players almost complete freedom over their gameplay experience.

SANDBOX GAMESPACES

In single-player games, developers create the feeling of a large open world by utilizing *sandbox* gamespaces. Sandbox worlds are named for their ability to have defined boundaries but also allow players to play however they want in less structured ways than many other games allow. One might imagine that the design of sandbox worlds is simple: provide the player with a large open set of spaces in which to play, and give him or her things to do. However, large spaces carry with them the problems of user orientation and location awareness.

As many real-world spatial designers know, these are problems regularly encountered by urban planners. It is perhaps not surprising that many of the most popular sandbox worlds are themselves cities. In this

section, we will explore some urban design principles that can be used to build successful sandbox spaces.

Pathfinding with Architectural Weenies

Perhaps one of the most important elements of sandbox spaces comes from creative pioneer Walt Disney. While shooting live action films with dogs, his studio would often need them to run across the set. To accomplish this, they would use sausages, which Disney called weenies, to entice the animals to run in the direction they wanted. Disney described tall buildings in his parks as having a similar effect for patrons by assisting with directional orientation. Jesse Schell, author of *The Art of Game Design: A Book of Lenses* and one of the designers on *Pirates of the Caribbean: Battle for Buccaneer Gold*, used the term *architectural weenie* to describe landmarks used to attract players to goal points in their game.

Architectural weenies are an integral part of sandbox spaces. They allow these worlds to retain their openness but still direct players to places that designers want them to go. Many designers, such as Scott Rogers, cite Disneyland and its twin, the Magic Kingdom, as inspiration for much of their level design knowledge. In the design of Disneyland, Sleeping Beauty Castle, Splash Mountain, and other attractions not only direct visitors to themselves, but allow them to understand where they are by using these elements as guide points. In *Grand Theft Auto IV*'s take on Liberty City, landmarks like the Statue of Happiness and Rotterdam Tower serve similar functions: directing players to them but also acting as guideposts while wandering the landscape. In Schell's examples, the term *architectural* is used to describe how level designers create not only designed building spaces, but also designed natural spaces, as *Battle for Buccaneer Gold* uses volcanoes, burning towns, and other attention-getting sights. Schell's designation of these objects also shows how architectural weenies can take many forms beyond tall buildings.

One game that cleverly uses architectural weenies is *Half-Life 2: Episode 2.* In one scene, players must use a radio to alert allies of an impending alien attack. The narrative sequence of this scene requires players to enter a building to determine that the radio both exists and cannot power up. Then, players must explore a nearby building to find the power source for the complex and switch it on (Figure 3.38). To keep the open feel of the landscape while directing player action, the developers textured the radio building with bright red and yellow hues and textured the larger tower building in drab browns. Despite its smaller size, this turned the

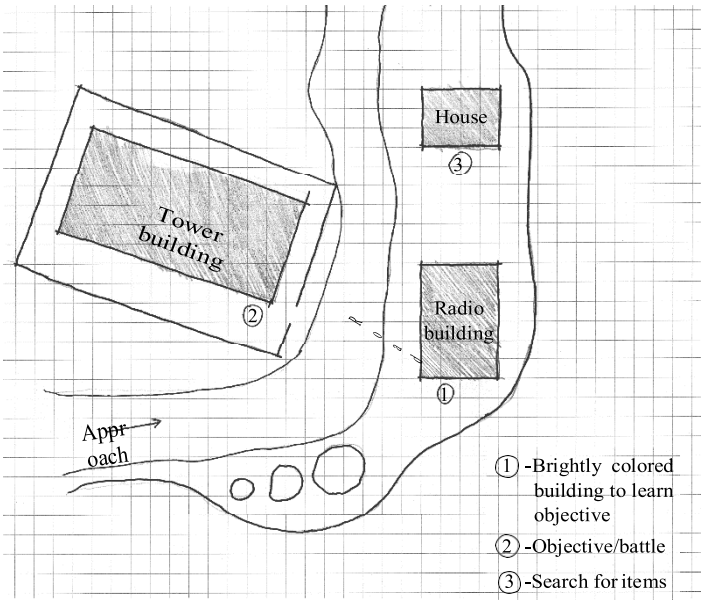


figure 3.38 A plan of the radio tower complex in *Half-Life 2: Episode 2*. While smaller, the radio building is textured with brighter colors that contrast with the greens and blues of the landscape. This directs player attention to it first, rather than the dark browns of the radio tower building itself.

radio building into an architectural weenie by making it stand out more against the natural greens, blues, and browns of the wooded landscape. Clearly, architectural weenies can take a multitude of forms. They can also serve a variety of tasks, including directing player action and helping players better navigate gamespace. In the next section, we will explore how this concept and others can further help players navigate sandbox worlds.

Organizing The Sandbox: Kevin Lynch's Image Of The City

As stated previously, finding one's way in a large open space can be daunting. For this reason, urban planners have developed a number of organization principles for how to structure urban spaces. In his influential book *The Image of the City*, urban planner Kevin Lynch reports the results of a five-year study of how people form mental maps of cities. From this study, Lynch advocates aiding visitors by organizing cities with these elements: landmarks, paths, nodes, districts, and boundaries. Organizing cities in this way creates what he calls *legibility* for observers of a city, which is what we should strive to achieve in our own sandbox gamespaces.

This section will look at each of these elements to understand how they may be applied to video game sandbox spaces.

Landmarks

Landmarks are recognizable elements that can be guideposts to people in an urban space. This definition should sound very similar to the concept of architectural weenies, as they are the same thing. As we discussed in the previous section, landmarks not only call attention to themselves, but also allow players to orient themselves by observing their relationship to the landmark in space. As many games do not utilize just urban-themed sand- box worlds—with popular choices including fantasy, post-apocalyptic, or historic landscapes—these landmarks can be natural objects or human- made elements that contrast with the rest of the landscape.

Half-Life 2 utilizes landmarks in an interesting way different from how they are typically used in sandbox games. While not a sandbox game itself, *Half-Life 2* strives to create the feeling of a large, seamless world by dividing levels with minimal fanfare: no menus, cutscenes, or other conspicuous scene transitions. The game establishes early on that a distant tower, the Citadel, is the home base of the game's villains, and that the player's final goal is to eventually reach and destroy it (Figure 3.39). This tower is visible from most levels in the game, and players can track their progress by observing how close they are to the structure.

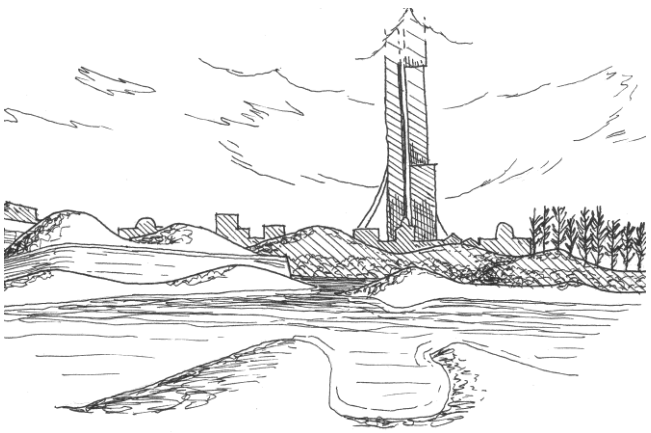


figure 3.39 The Citadel in *Half-Life 2* is a useful landmark for players to understand not only where they are in the game's large world, but also how far they have progressed in the game itself. The game establishes early on that its climax will take place there.

The Citadel shows how versatile landmarks are. They can direct player action, allow them to orient themselves in a large sandbox space, or track their progress by measuring their proximity to them.

Paths

We have already discussed circulation spaces, channels for travel that connect significant gamespaces. Lynch discusses these types of spaces in his book as *paths*. Paths in urban design include roads, sidewalks, and other thoroughfares that allow people to travel through the city.

In terms of molecule design, these paths are the lines that connect significant gamespaces. They can have their own challenges, but are often intimately scaled spaces without significant aesthetic features. Their purpose is to usher players through to the next point of important game- play. In our previous example of Liberty City, paths are the same types of spaces—streets, sidewalks, etc.—as those suggested by Lynch.

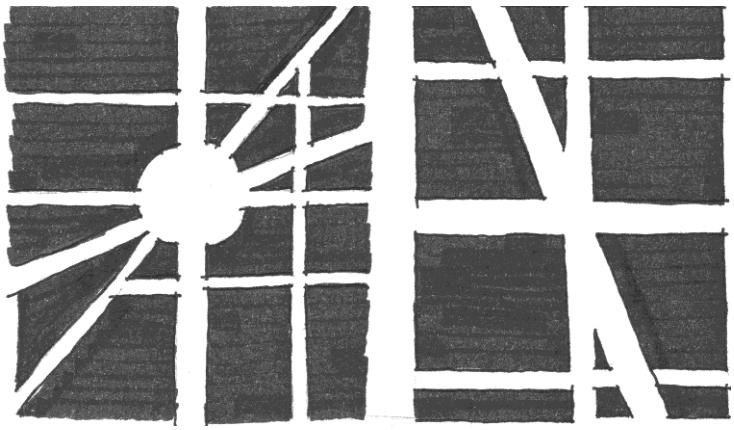
On the other hand, games like *The Elder Scrolls V: Skyrim* do not represent their sandboxes as large urban spaces, but as open landscapes. As such, many of the paths between towns, dungeons, and forts are much less direct and are, in fact, open fields. This allows players to enact their own Steiner points by taking direct routes between landmarks. While these paths might not be explicitly designed as such, they are recognizable. However, they run the risk of getting the player lost in their vast openness. To mitigate this, designers use subtle geographic features such as dirt paths, signposts, or rivers to evoke more direct pathways represented in urban plans.

For designers working in engines such as those described in Chapter 2, keeping these guidelines in mind when working with tools such as in- engine terrain editors is important for creating worlds that are not just aesthetically attractive, but also usable.

Nodes

In many urban spaces, the intersections of pathways offer a variety of opportunities for engaging users. Not only can they be their own guide points for navigation (such as when you direct someone to a business by telling them what corner it is on), but they can also be places for people to gather or interact (Figure 3.40). Lynch calls these intersections *nodes* and highlights how they can be important focal points for large networks of paths.

Nodes can be locations for landmarks to reside, channeling different paths onto one end goal. They can also, as Lynch points out, be strategic



Logan Circle
Washington DC

Star Junction
Liberty City

figure 3.40 Nodes at the intersections of paths offer opportunities for players to make strategic choices of where to go next in a game world and interact with NPCs or other players that may be gathered there.

decision points at which observers can decide what path to take next. In many open-world games such as *Skyrim*, such decision nodes are every- where, forcing players to prioritize how they wish to spend their time: do you want to go find things to do in a town or explore dungeons?

These decisions become even more interesting when they take on moral or narratological purposes. For example, Rockstar Vancouver's high school-themed sandbox game *Bully* allows players to explore the fictional town and private school campus, taking on missions for various cliques in the school. The reputation the player has with each clique—bullies, jocks, nerds, greasers, and preppies—forms the game's morality system. If the player does something to impress the nerds, he or she may lose the favor of the jocks, etc. Spatially, the game offers many nodes at which the player can not only interact with NPCs, but also choose clique-friendly locations such as the gym, library, or autoshop (Figure 3.41).

Edges

Edges, according to Lynch, are boundaries not formed by paths. They are linear elements that mark a transition from one continuous area or condition to the next. Edges can be walls, rows of buildings, changes in vegetation, or other markers that show that an area has changed in character or genius loci. In sandbox games, areas of varying genius loci allow players to feel that the world has variety in the way that games with distinct level theme types—ice, fire, forest, etc.—have (Figure 3.42).

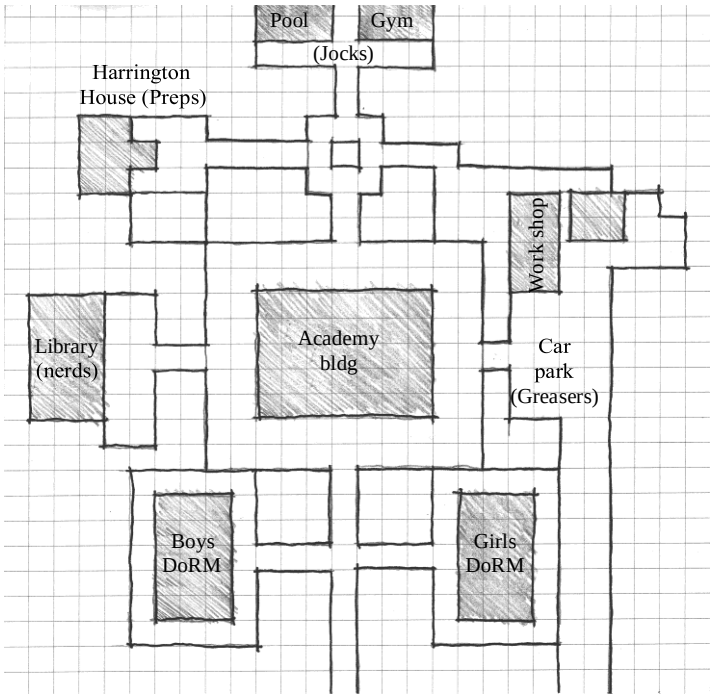


figure 3.41 The grounds immediately outside the Bullworth Academy school building in the game *Bully* are a node that offers access to a number of land- marks important to the game's various cliques. The academy building itself is a landmark that also serves as an architectural weenie, allowing players to orient themselves by their spatial relationship to it.

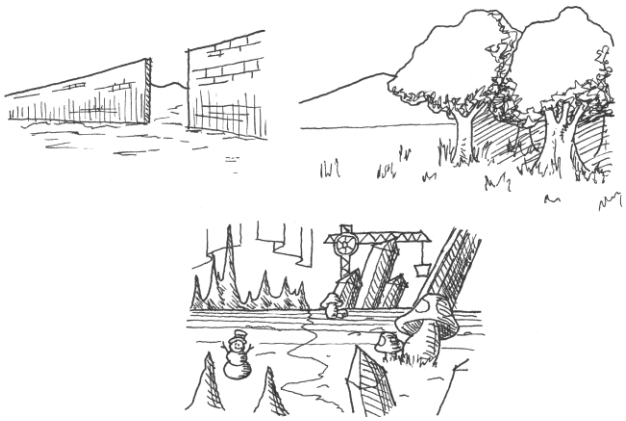


figure 3.42 Different types of edges in sandbox worlds.

In 1949, mythologist Joseph Campbell described the hero's journey monomyth in his book *The Hero with a Thousand Faces*. As summarized by Campbell, the hero's journey plays out in this manner:

> A hero ventures forth from the world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boons on his fellow man.

In *Origins of Architectural Pleasure*, architect Grant Hildebrand con- siders a spatial version of the monomyth focused on the journey's *materiality*. Materiality is the understanding of textural and visual qualities of a surface. As applied to the hero's journey, Hildebrand notes that as the hero ventures from his world, the materiality of his surroundings change from that of comfort, to epic wilderness, and often to a dark, corrupted state when encountering the final enemy. One sees this pattern play out in numerous works of literature, film, and games: from *Beowulf* to *The Legend of Zelda*.

From a production standpoint, edges can mark a change in *art style*. The type of architectural or vegetation models you use can shift, signifying the change to a new area. Likewise, transitions between textures on surfaces can generate player-perceived edges. These transitions can be quick or gradual. A quick transition may mark a defined border, and can often be accompanied by architectural details such as walls or gates, as landscape rarely transitions suddenly. These are especially useful if the area you are entering is the site of an event—a battle, fire, alien encounter, etc.—or if you are transitioning the realm of a specific group. Gradual transitions, on the other hand, may help build anticipation for reaching a new zone. Burned trees, arrows, and other ammunition sticking out of the scenery, etc., can give the impression that you are about to enter a dangerous area, creating a tension when approaching it. They can also indicate that you are reaching a natural border between environment types—plains to forest, desert to canyon, etc.

Districts

The last of Lynch's elements is the *district*, which he describes as sections of a city where the observer enters "inside of" and which have some identifying character. In the previous section, we discussed how changes in art style, environment art elements, and texture can indicate changes in

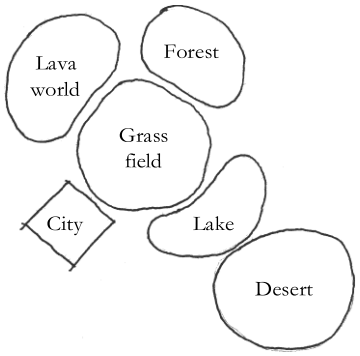


figure 3.43 A theoretical game map showing districts.

environments within a sandbox world. Once past these edges, players find themselves within districts (Figure 3.43).

Beyond changes in style, districts in games differentiate themselves from one another with changes in gameplay: types of NPCs, enemies, events, or mini-games. Districts can be containers for distinct narrative events or gameplay challenges. In the example of Disneyland, the park is divided into distinct districts: Tomorrowland, Fantasyland, Frontierland, and others that have their own distinct character and set of themed attractions. Likewise, *Grand Theft Auto IV*'s Liberty City has several distinct districts of its own: the Algonquin district features skyscrapers and night- clubs, while Broker is a relatively poor district where the player first inter- acts with several of the city's criminals.

If sandbox worlds do not have distinct districts, or if districts do not have their own unique gameplay elements, sandbox worlds can feel empty. In the unfortunate case of Santa Destroy from the game *No More Heroes*,[39] the city has many landmarks but few distinct areas of town. Instead, the entire city is a South Los Angeles-styled environment with a few disparate shops and locations to explore and take on missions. The game's action stages, on the other hand, occur in more distinct linear environments separated from this sandbox world. As reviewer Mark Bozon pointed out, "If the game was based only on the open world style, it would have been a pretty sizable disappointment." If the unique character of the game's action levels were carried over to the sandbox world, the city might have not only been more fun to explore, but also more believable as an urban space.

Clearly, a successful sandbox world is based on how well a player can "read" and understand it. In many games, as in real-world architecture, lines of sight and understanding the point of view of players are of the utmost importance. What, however, is the designer to do with the spatial lessons we have discussed—largely based on real-world first-person points of view—if a game is in the third person, or even in two dimensions? In the next section, we will discuss how a player's point of view impacts gamespace.

CONSIDERATIONS OF CAMERA

Since the release of the German driving game *Nurburgring 1* in 1975 and its American counterpart *Night Driver* in 1976, first-person games have been a part of the gaming landscape. However, it was not until the early 1990s and the release of id Software's *Wolfenstein 3D* that first-person games grew to the dominance they hold today. Indeed, many first-person games prior to *Wolfenstein* had abstract vector graphics or had to show static images rather than displaying a real-time textured 3D environment. Meanwhile, other games utilized 2D viewpoints from the side of the player character, known as *side scrolling* (Figure 3.44), or from above the player character, known as *top down* (Figure 3.45), to show the action of a game.

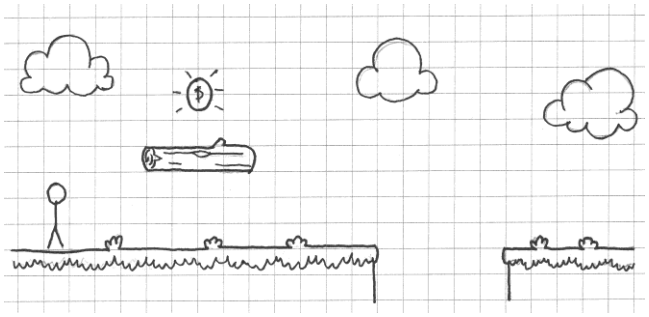


figure 3.44 A 2D side-scrolling game. The view could be said to be a section of the gamespace.

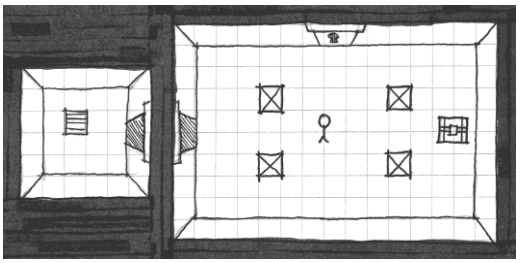


figure 3.45 A 2D top-down game. The view could be said to be a plan of the gamespace.

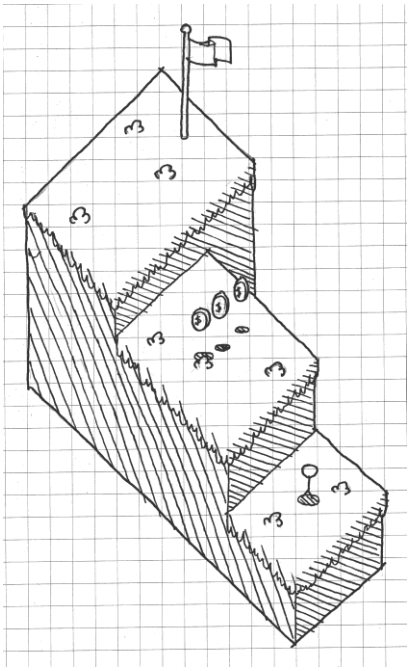


figure 3.46 A 2D axonometric game.

There were even axonometric (popularly called *isometric*) games such as *Zaxxon* and *Q*Bert* (Figure 3.46).

In many modern game engines, point of view is dependent on where the designer places the *camera*, an object from which the player views gameplay. In a first-person game, the camera is located on a player object and given scripts that allow the player to look around freely. In a 2D game, the camera looks from either the top or side and often has options for perspective turned off, giving the camera an *orthographic* view. Axonometric and isometric views often feature cameras that look down on the player from up high. In this section, we will discuss how camera placement offers different limitations and opportunities for how gamespace is viewed.

3D views

As most modern games are 3D, and since architecture is most often experienced by visitors in a three-dimensional fashion, we will dis- cuss 3D views in games first. The two most popular viewpoints for 3D games are from the first-person view and the *third-person view*, where the camera is located outside of the player character's body. While the difference between these two viewpoints is often minimal, there are gameplay situations better suited to one or the other, which we will explore here.

First Person

First-person games are those where the camera is located in the "head" of the player character mesh (if the game uses a defined mesh for the player character at all) and action is viewed from the character's eye level. This is the most natural game view, as it is the view from which we view our own world (Figure 3.47).

It is in first-person games where level designers have full use of many of the architectural concepts discussed in this book. It is also where designers must use the most architectural tricks to capture players' attention, as the player has control over where the camera is looking, unlike in other game types. In *Half-Life 2*, for example, designers had to find ways to keep players near narrative events where NPCs were talking, since the game does not use passive cutscenes. Indeed, during narrative events and gameplay, designers must create lines of sight to direct player attention to details or direct their movement. The exterior contours of a gamespace are not visible from this point of view, so spatial size types, architectural weenies, and other design arrangements must be used to usher players through the gamespace.

From a gameplay perspective, first-person games can be very immersive, allowing the player to better take on the role of the game's protagonist. There are things that can also be limiting in first-person views, such as platform jumping and melee fighting mechanics that often benefit from a wider perspective.

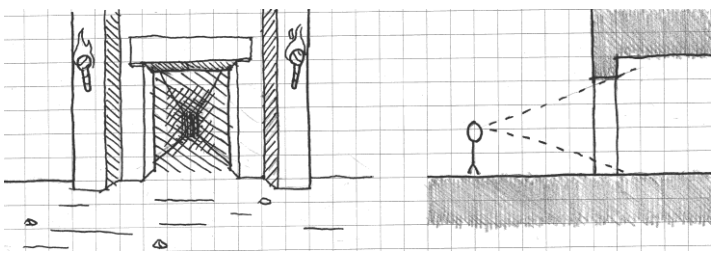


figure 3.47 Cameras in first-person games are located at the eye level of a player character and allow for maximum use of sight lines.

Third Person

Third-person games are those in which the viewport camera is placed somewhere outside of the player character's body. Even among third-person games, there are many different varieties of view types. The first is *rotating camera*, which has the camera move around the player either in or out of his or her control. The second is *behind*, where the camera stays at a fixed point behind the player, typically by making the camera a *child object* of the player object. The third is *over-the-shoulder*, a semi-hybrid of first and third person where the camera is close behind the player character and allows the player to move the camera to look where the character is looking (Figure 3.48).

Third-person games offer many of the same spatial opportunities as first-person games, most notably the ability to create full 3D environments where lines of sight and other visual tricks can be used to direct player attention. They also offer opportunities to play with a camera's sense of perspective: by changing viewing angle options that many game engine third-person cameras have, designers can get trippy Tim Burton-esque angles and perspectives (Figure 3.49). Third-person cameras are also used in *fixed-perspective* games such as *Resident Evil* or *Killer 7* to create cinematic camera angles: shots from below, in front, close up, or others. These can greatly increase the dramatic effect of certain scenes, though often come at the cost of ease of control of the player character.

Third-person games offer additional opportunities for 3D game types that first-person games often struggle with. The most notable is platform jumping, since the player can see where the player character's feet will land. Designers often add a shadow underneath the player character to

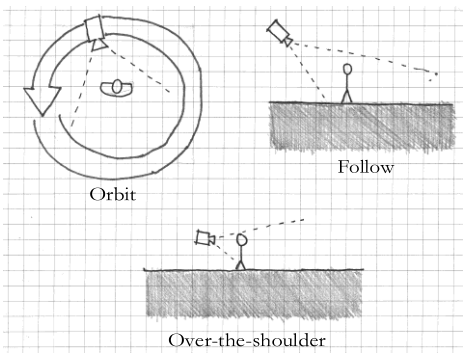


figure 3.48 Three common types of third-person perspective in games.

figure 3.49 In this screenshot from the short game *The Nightmare Over Innsmouth*, prepared for a presentation at the Game Developers Conference (GDC) in China, the designer modified the camera lens angle to get a warped perspective effect.

further help players find their way, such as in *Super Mario 64*. This is even more helpful in games with more acrobatic platforming, such as *The Prince of Persia: Sands of Time*, where players can take time to line their character up with poles, swings, ledges, and other obstacles that the Prince can climb on. This game also features brawler-style melee combat where players must move in and out of groups of enemies, something that would be difficult to do in first person.

Third-person games suffer in the area that first-person games excel in: aiming. Camera AI is also notoriously difficult to code well, so cameras that "want to kill players" are a common problem in third-person games. Over-the-shoulder third person mitigates this to a point, though some line-of-sight spatial relationships are better understood in first person.

2D views

Before good-looking 3D was technologically possible, 2D games dominated the industry. Visually, a textured surface in 2D was more believable than the vector-generated surfaces of many early 3D games. In terms of mechanics, many of the things one can do in a 3D game can be done in a 2D game: platform jumping, shooting, exploration, and others. Since the heyday of 2D was when gaming devices were not powerful enough to create realistic graphics, 3D games were long considered to have a presentational advantage over 2D games. Now, as 2D games are being revisited on modern gaming technology, they are home to presentational styles that mimic hand-made arts such as painting, sculpting, crafts, and even knitting.

Games viewed at a 2D perspective have an interesting ability that most 3D games do not: showing the player things that are beyond the eyesight of the player character. In the *Metroid* series, it is common for players to see an upgrade hidden in several feet of rock waiting to be claimed, though the player character would logically have no idea it is there. This technique is very similar to the one employed by director Alfred Hitchcock to create *suspense* in his films.

A favorite example of Hitchcock's was to propose a scene where two people were sitting at a table, but the camera pans down to show that a bomb is underneath. That the diners do not know of the impending doom instills the scene with suspense for the audience that does get to see the bomb. The game *Metroid Fusion* utilizes this when an evil clone of heroine Samus Aran, the SA-X, walks through a hallway that is below the player. While Samus herself would possibly be able to hear the footsteps of the clone, the player gets a suspenseful view of how narrowly he or she is escaping death (Figure 3.50). Sadly, this technique is underused in 2D games, though there are other view-specific techniques that apply to the two most popular types of 2D views: side scrolling and top down.

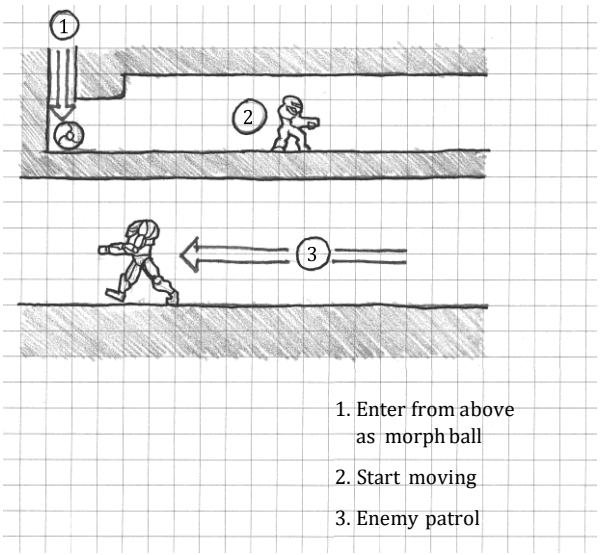


figure 3.50 The *Metroid* series uses 2D perspectives to show players the location of hidden items and passages. Likewise, *Metroid Fusion* uses this perspective to create Hitchcock-esque scenes of suspense.

Side-Scrolling Space

Side-scrolling gamespaces are ones viewed from the side of the player character as though looking at a building section. Side scrollers can be some of the most spatially limiting level types, as there is not much one can design in the way of pathfinding. One's location in a side-scrolling level can also be difficult to track, especially in large open-world 2D games, typically termed Metroidvania for their popularity in the *Metroid* and *Castlevania* series.

The simplicity of side scrollers makes them effective at teaching their own mechanics: they put everything the player needs to know in a screen- shot's distance from his or her avatar. Side-scrolling games often deal with action best understood from a "to the side" point of view, such as jumping, climbing, flying, and shooting. As such, it is important that when designing side-scrolling levels, there are very few "leaps of faith" that the player must take. Even large pitfall obstacles must show you their other end in one screenshot's width from the side where the player is standing (Figure 3.51). It is important for side scrollers to practice their own type of *visual level metrics*. Beyond simply making obstacles easily understand- able, enemies and enemy projectiles should always leave enough time from when they enter the screen to when they reach the player such that the player has a chance to see and avoid them (Figure 3.52).

Unfortunately, side scrollers render many of the pathfinding and orientation methods we have discussed thus far useless. There are some, however, that experiment with not only height and width, but also depth by putting 2D level environments in layers that can be moved through forward and backward. Games such as *Shantae: Risky's Revenge* utilize this to give in-game villages a more realistic feel. Mazes in this game are more complex, as the player must not only move through left/right (x) and up/down (y) axes, but also forward/backward (z) (Figure 3.53).

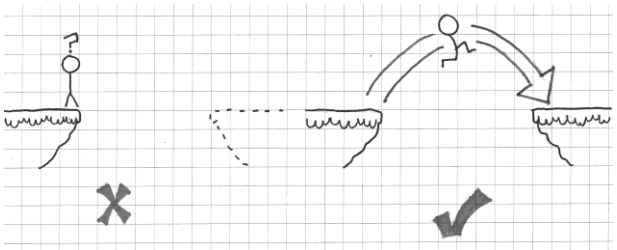


figure 3.51 In 2D side scrollers, designers should avoid adding "leaps of faith" to their games and always allow players to see the other side of obstacles from within one screen's width.

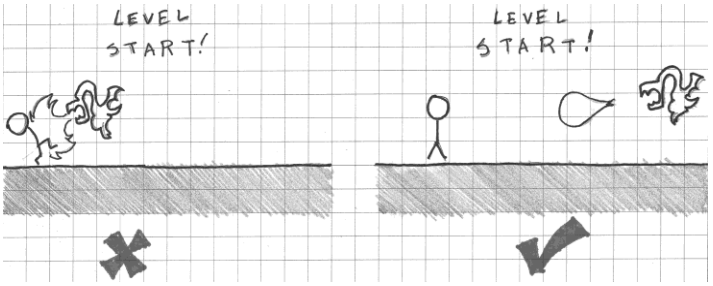


figure 3.52 Enemies and their projectiles in 2D side scrollers should leave enough time from when they enter the screen to when they reach the player so that the player has a chance to avoid them.

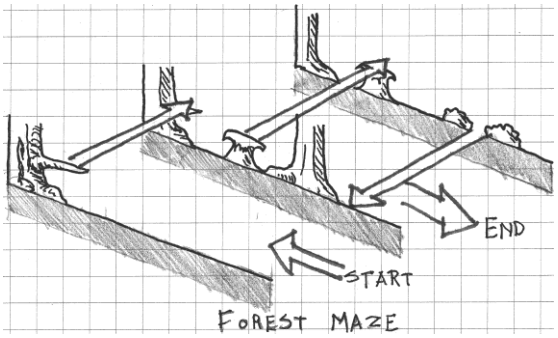


figure 3.53 Many environments in *Shantae: Risky's Revenge* allow the player to move forward and backward through layers of 2D side-scrolling environments. These add another level of depth to in-game mazes and dungeons not common in many side-scrolling games.

Top-Down Space

Top-down gamespaces are ones where gameplay is viewed from above the player character as though looking at a building plan. Indeed, many early games resembled maps and building plans. On one hand, top-down games offer little in terms of creating sight lines and other things that are common in 3D games. However, they excel at creating opportunities for orientation, as many gamespaces can be understood in plan. These spaces can be understood as following the cardinal directions of north, south, east, and west, so devices like landmarks allow players to find their way through large gamespaces (i.e., "I am north of Hyrule Castle").

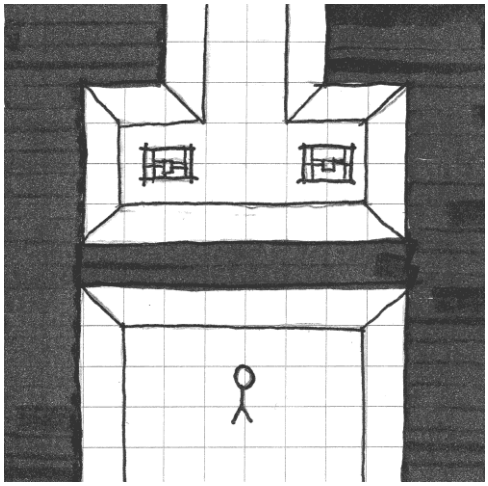


figure 3.54 Like side-scrolling games, top-down games can show players things that the player character cannot necessarily see.

Like side scrollers, top-down games share the potential for Hitchcock- style suspense due to their ability to show players things that the player character cannot necessarily see (Figure 3.54). Also like side scrollers, enemies should leave enough time between appearing on screen and when they hit the player such that the player has a chance to move.

Top-down games often feature mechanics that are best enacted in an expansive world, such as exploring or interacting with NPCs, though there are certainly exceptions. Top-down games, like side scrollers, are also well suited to mechanics that involve lining the player character up with a tar- get such as shooting, sword fighting, or even rudimentary jumping. On the other hand, top-down games tend to be less reliant on reaction-based action than side scrollers, so more environmental information can be held off screen (Figure 3.55). In fact, withholding the entirety of a landscape or architectural feature in a top-down gamespace may actually invite players to explore further.

Now that we have explored the opportunities present in both 3D and 2D game views, we will look at those present in a type of gamespace that straddles the line between the two.

Axonometric/isometric views

In the early 1980s, developers utilized a new game view type—the axonometric game—to create the impression of 3D space while utilizing art that

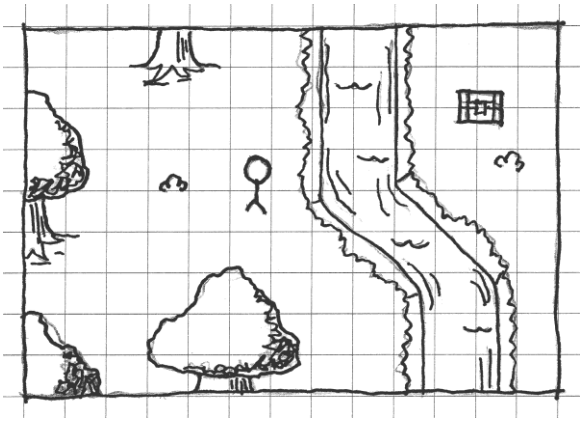


figure 3.55 Since many top-down games involve exploring expansive worlds, information can be withheld off screen from players. Giving players incomplete information, such as showing part of a landmass or river in one screenshot, invites players to explore further.

was still actually 2D. Following early axonometric games like *Zaxxon* and *Q*Bert*, this view continued to be popular in games from *Knight Lore* to *Starcraft*. In games, this point of view is often referred to as *isometric*, as that is the type of axonometric projection used to create the game art.

In classic axonometric games, the game is typically viewed without perspectival distortion, that is, without the objects on screen viewed along sight lines that meet at a vanishing point. While purely axonometric images can create a dramatic 3D effect, they also come at the cost of depth perception for the player. Axonometric drawings are notorious for the creation of optical illusions such as that shown in Figure 3.56. When constructing axonometric gamespaces, it is important to show the *vertical relationships* between surfaces very clearly so players are not confused by an object's position in space. Likewise, it is important to *occlude*, or disable the rendering of, foreground objects in these spaces so players do not lose their character when they move behind structures.

Isometric as a term has also been adopted by modern 3D game developers to describe a camera that is positioned at an angle above the player character looking down, with perspective options enabled on the camera object itself. This type of perspective is actually described as *three-point perspective*, as edges meet not only at horizontal vanishing points com- mon to two-point perspective, but also at a vertical vanishing point below the level. Unlike actual isometric or axonometric views, changes in height are easily perceived thanks to the perspective option of the camera.

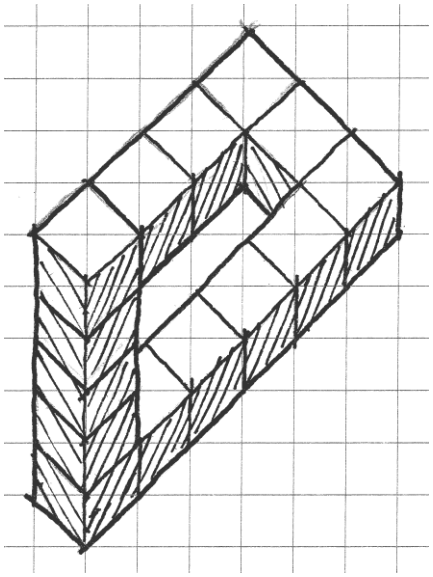


figure 3.56 Axonometric drawings can easily disorient the player if not drawn properly. When making these kinds of gamespaces, make sure you find ways to show vertical spatial relationships.

This type of view, in both classic and 3D versions, allows for both a detailed 3D environment and the designer to show the player things that the player character cannot see.

Axonometric views can make it difficult for players to orient themselves in space. Unlike top-down 2D views, the player cannot benefit from the use of cardinal directions. And since the camera is facing downward, they also cannot make use of sight lines, so as much information should be on screen as possible, unless the world is an expansive one similar to those found in top-down 2D games. However, isometric games allow designers to make dramatic use of spatial size types, as players can easily see how their character relates to the environment around them. Still possible is creating a sense of claustrophobia with narrow spaces or a sense of agoraphobia with prospect spaces. In fact, these spaces' three- point perspective allow for the use of rhythmically arranged vertical elements to create a sense of *epic hugeness* in prospect spaces—creating a sense of *vertigo* as the player looks from the camera down at his or her character (Figure 3.57).

figure 3.57 In this screenshot, regularly spaced biotanks are used in this lab environment to create a sense of vertigo from the camera down to the player character. This emphasizes the verticality of the gamespace, even though the player is viewing the game from a third-person perspective.

Now that we have discussed camera views and how they correlate with player perceptions of space in games, we will explore one last basic spatial concept. This concept will help us take an element unique to games and utilize it to toy with how a player perceives the nature of space around him or her in games.

ENEMIES AS ALTERNATIVE ARCHITECTURE

In *Chambers for a Memory Palace*, Lyndon and Moore describe the concept of *allies*: statues, short columns, and other architectural elements that are of similar scale to an occupant. Beyond iconographic significance, they point out that allies in a piece of architecture can make spaces more inviting. In games, non-player characters fulfill many of these functions and often have their own gameplay reason for being in a space, sending the player on quests, guarding doorways, etc. NPCs that instigate quests often prohibit players from moving through a space until specific tasks are accomplished. As such, NPCs can help designers drive player interaction with the game world.

One key difference between gamespaces and real architecture is that enemies, not just allies, can also inhabit gamespaces. Enemies offer level designers a unique type of architectural ally in their antagonistic relation- ship with the player. Where friendly NPCs may simply block a space until the player helps them, enemies block spaces by threatening to damage the player. As the player cannot directly pass through enemies without risking damage, game enemies can be seen as *alternative architecture*. In the train station environment at the beginning of *Half-Life 2*, alien soldiers are used as alternative architecture. While many games use locked or non-interactive doors to show a player they cannot enter a room, *Half-Life 2* places sentries throughout a train station. If the player tries to pass, he or she is shoved back. Further

attempts by the unarmed player are met with the aliens brandishing their weapons, an effective deterrent. Using interactive enemies rather than plain locked doors does several important things for the game: it builds *Half-Life 2*'s dystopian narrative without exposition, it directs player movement through the station, and it creates the feeling that this station is populated, just as Lyndon and Moore argue is the role of architectural allies.

Using enemies as architectural elements of a level can be a powerful tool for level designers when paired with narrow space as well. In the original *Resident Evil*, for example, zombies fill the narrow hallways of the Spencer Mansion. As they approach players, they block off progress through hallways while shrinking the space the player can safely occupy. Players in this situation must decide whether to risk running past the zombie or shoot it.

As the *Resident Evil* zombies demonstrate, even enemies with simple AI can be powerful spatial tools. In his essay "The Rules of Horror: Procedural Adaptation in *Clock Tower*, *Resident Evil*, and *Dead Rising*," Matthew Weise describes a concept he calls the *shrinking fortress* in zombie films. In shrinking fortress scenarios, such as the one in *Night of the Living Dead*, the protagonists are surrounded by a large group of enemies, which continually advance on them and capture once-safe territory. In *Night of the Living Dead*, for example, survivors fight to protect themselves within a farmhouse. Eventually, the first floor of the house is overrun, and the heroes must retreat into the basement. This scenario can play out in games through story events that cut off previously accessible areas.

An even more powerful application of the shrinking fortress can occur in real time. Strong or difficult-to-kill enemies may be used to *herd* the player where the designer would like him or her to go (Figure 3.58). For this tactic to work, the enemies should be in overwhelming numbers, have

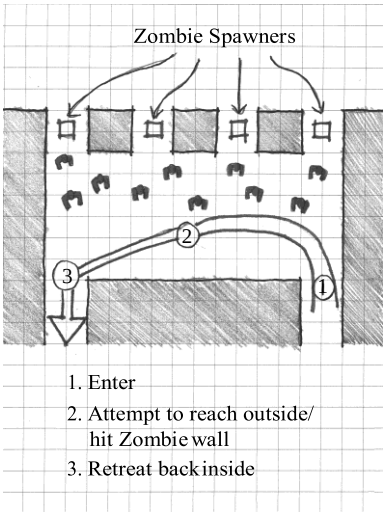


figure 3.58 Enemies may be used to herd players where designers want them to go. For this to work, a large number of difficult-to-kill enemies should be used.

powerful attacks, or be difficult to kill. A scenario like this often requires the level space itself to be large, though swarms of enemies will create the feeling of narrow space. Applications like these demonstrate the power that level designers have to use enemies, NPCs, and other game elements not traditionally viewed as architecture for architectural purposes.

SUMMARY

In this chapter, we have explored some basic spatial types that we can use to form our game worlds. From micro-scaled articulations of additive and subtractive space to world structures such as sandboxes, hubs, and classic gamespaces, we now have a set of spatial configurations to create with the game engine tools discussed in Chapter 2. We also know how to cater gamespace to the kinds of gameplay experiences we wish them to house through spatial size types. To pace these elements out or study how they interact with one another, we can utilize molecule and proximity diagrams. We can also organize large worlds of gameplay through urban design principles. On the player end, we can cater player experiences of our gamespaces to the point of view they will have through in-game cameras. Lastly, we can use not only friendly NPCs, but also enemies to populate our game worlds, enhance the spatial types we have discussed, and direct player action. In Chapter 4, we will discuss more directly how to create game levels that teach the mechanics of a game to players and reinforce these mechanics through the entirety of a game.