Chapter 9
Architectural Spaces and Level Design in Modern Games

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9.1 INTRODUCTION

An emerging area of game analysis is that which compares interactive games to works of architecture and urban design. As early as 2002, game designers such as Ernest Adams found comparisons between games and architectural space. In Adams’ article for Gamasutra, “Designer’s Notebook: The Role of Architecture in Videogames,” he connects the architectural spaces of games with direct constraints on gameplay, such as providing obstacles or managing exploration, and indirect constraints, things like building atmosphere and storytelling through architectural allusions. In 2007, Space, Time, Play offered an overview of contemporary intersections between these fields. The explorations in this text included games where players interacted with environments in novel ways, technologies which added a digital layer to our real, architectural world, and games which used those technologies to create new interactions. In 2008, Michael Nitsche’s book Video Game Spaces: Image, Play, and Structure in 3D Worlds addressed game worlds and how players perceive them via the structures of screens and input methods. Written for games researchers, this book offers a tantalizing view of how spatial analysis might be used to understand the practical elements of how players interact with the spaces inside games. Game studies scholar Bobby Schweizer does much of the same in studying the urban design of game cities: with promising explorations of how gameplay affects and is affected by players’ perceptions of game cities.

In the latter years of the 2000s, a slew of texts appeared written by game industry veterans on level design, the organizing of environmental geometry and interactive mechanisms within a game such that the resulting space creates satisfying interactions. While books on the topic had existed before this time, most emphasized the tools used for building levels rather than level design processes or spatial aesthetics. Unsurprisingly, level design was seen as notoriously difficult to write about. Beyond the perceived unavoidability of the tools, Ernest Adams and Andrew Rollings argued that the definition of what made a “good” level changes dramatically based on the needs of individual games.

Rudolf Kremers’ book, Level Design: Concept, Theory, and Practice, was among the first to challenge this perception. It provides a groundwork for studies of level design based on abstract gameplay factors that can be applied to any genre, such as interactivity, pace, worldbuilding, and sensory perception. While not specifically a work about level design, Anna Anthropy and Naomi Clark’s book Game Design Vocabulary offers more
useful models for understanding how game levels create interesting gameplay. Designer and scholar Robert Yang has extensive work on level design and theorized its connections with architectural design. His academic work includes meditations on connections between game and architectural spaces and his industry scholarship is often featured in the yearly Level Design Workshop at the Game Developers Conference (GDC).

By 2011, the connections between architecture, game design, and level design were already of great interest in both academic and industry contexts. Having a background in architecture and having done much of my graduate work on the intersections between architecture and games, I started writing about these connections with direct allusions to architectural design theory while also acting as a level designer and artist for several independent games. In 2014, I published a book compiling my experiences and work with level design and architecture, *An Architectural Approach to Level Design*, a second edition of which was published in 2019. Beyond the world of book publishing, level design studies have expanded to include works in the gaming press and popular gaming YouTube accounts, including everything from studies of methods to theory.

While architecture itself is a useful lens for understanding games and the levels within them, the recent emergence of architectural game design theory and level design theory as areas of study may also point to evolving attitudes about how games are viewed. These attitudes are influenced by fan communities which see not only levels as distinct works from the games they inhabit, but also the artwork, music, sound effects, and other multimedia building blocks of games. This chapter will address attitudes towards understanding games as both singular and collected works and how these mindsets lead scholars to integrate knowledge from fields like architecture into their game analyses. It will also address how processes from architecture such as “design thinking” and “pre-design analysis” can be used by game designers to draw inspirations from works outside of games and align their work with the wider art and media landscape.

### 9.2 THEORIES OF GAME ANALYSIS

For those who attend the gamut of events in the game industry—fan conventions, industry gatherings, and academic conferences—these events hardly seem as though they center on the same medium. At events like the yearly Music and Gaming Festival (MAGFest) or the Penny Arcade Expo (PAX), fans revel in obscure gaming lore, listen to music from famous
games, and sell artworks of beloved characters. Industry events are more professionally focused, but they recognize the distinct disciplines that come together to create the media productions that we call games. Conferences such as the GDC or the East Coast Games Conference (ECGC) offer discipline-specific speaker tracks in areas like visual art, programming, sound design, business, production, and so on. Games academia feels dissonant in this way, where games are rarely classified according to anything beyond the ways in which players interact with them. On one hand, this is to highlight the unique aspects of the medium: that a player moves physical components according to rules or uses an input device to affect the game’s state. On the other hand, the effect that game artwork, sound effects, music, physics simulations, and so on have on the player’s experience of a game are left under-analyzed.

Both of these mindsets have a place in our understanding of games. In many ways, they must both be understood if we are to see how an element of games, such as levels, might be aligned with the work of disciplines outside of games, such as architecture. In this section, we will explore these different mindsets to discover ways in which they shape our ability to place games among the landscape of other media works.

9.2.1 Single Work Theory

In academic contexts, games are typically discussed as whole objects rather than as collections of assets, or individual pieces of art or music that are loaded into the game during gameplay, that combine to create interactive experiences. Much of this mindset stems from social science understandings of games, influenced by the works of historian Johan Huizinga, sociologist Roger Caillois, and others who explored the place of play and games in human society during the mid-twentieth century. In these texts and those that have come since, such as James Paul Gee’s *What Video Games Have to Teach Us About Learning and Literacy*, games are treated as singular objects that might be applied to transform the player in some way. All of Gee’s 12 basic learning principles, for example, orbit around games’ interactivity regardless of other elements that might influence a learner such as art or level design.

The influence of these models continues even in works written by game designers that address games as media productions. In their “G/P/S model” of classification for Serious Games, games developed for non-entertainment purposes, Damien Djaouti, Julian Alvarez, and Jean-Pierre Jessel focus on games’ “game-related” and “serious-related” characteristics,
avoiding elements of the games’ productions. Likewise, John Sharp in his book *Works of Game* organizes games with contemporary art-related expressive purposes into *Game Art*, *Artgames*, and *Artists’ Games*, each of which consider games by their relationship with play and interactivity.

Some of Sharp’s classifications, such as *Game Art*, which uses the tools and visual language of games to make non-interactive media art works, and *Artists’ Games*, which subvert the elements of games to make expressive artworks, come closer to acknowledging the assets within games, though the focus of these remains games as singular objects. Even the useful MDA Framework for game analysis classifies “aesthetics,” classically defined as the principles and appreciation of beauty as understood by the senses, according to positive effects of interactivity. We will define this focus on games as singular works whose defining characteristic is their interactivity as the *singular work theory* of games criticism.

As we saw with Gee, this is a useful model when considering games as a medium with transformational potential, as with educational, expressive, or “serious” games. It is also employed by museums when exhibiting games: treating them as individual *objects d’art* curated according to a theme as in the yearly Smithsonian American Art Museum (SAAM) Arcade. Singular work game production celebrates the role of individual designers or directors in a game’s creation, greatly resembling filmic *auteur theory*. While this applies to many older commercial games from the beginning of the medium (Atari 2600 and early PC game eras of the 1970s and 1980s) it presents issues in more modern contexts where game production is a collaborative effort between potentially hundreds of professionals of varied, but equally important, disciplines.

In the context of comparing games to disciplines outside of games, such as art and architecture, single work theory offers an easily understood method for engaging with audiences not deeply familiar with the games medium. In the typical way it is employed, as with the MDA Framework, single work theory in games focuses on the experience created by the game as understood by the game’s players. In this way, one might find a useful analogy between the summative effect of playing a game and the holistic experience of being inside a spiritual space such as a church or mosque. An observer in this mindset is evaluating the experience of being inside such a space, and not examining individual three-dimensional sculptures, lighting, or the imagery on surfaces. Single work theory is also at its best when evaluating the expressive goals of games, aligning it with the goals of contemporary art made to communicate abstract ideas. For games such
as Anna Anthropy’s *Dys4ia*, 24 Nina Freeman’s *Cibele*, 25 or Jason Rohrer’s *Passage*, 26 single work theory is useful for shifting focus from technical aspects of a game to their personal or expressive goals.

9.2.2 Collected Work Theory

A video game *asset* can be many things. On one hand, they might be several pixel-wide icons integrated into a larger graphical user interface (GUI)—not something that many would notice. On the other, a sweeping piece of orchestral music might also exist in a game’s files as an asset. Let us assume that this piece becomes a fan favorite part of the game: maybe it plays during the climactic battle with the game’s villain or a moving story moment. Such an asset could find relevance well beyond the game itself: it could be downloaded and listened to by fans of the game, sold as part of a soundtrack album (on vinyl special edition!), or covered by game rock or jazz bands at an event like MAGFest.

Music is just one aspect of this phenomenon: as game enthusiasts regularly pour their enthusiasm and creativity into adapting artwork, design elements, characters, narrative events, and other portions of games into new works. Commercial game studios participate in this phenomenon when they release concept art books and game soundtracks from their most popular games. These products make artists, composers, and designers highly visible to audiences through individual credits, liner notes, and interviews. These elements may even provide unique selling points for games: Studio MDHR’s *Cuphead* 27 features visual art made to resemble 1930s American cartoons made with real-world art supplies—ink pens and watercolor. An older but still illustrative example are the competing versions of games based on Disney’s *Aladdin* film for the Super Nintendo and Sega Genesis game consoles. 28, 29 Despite the popular perception that it had inferior gameplay, the Sega Genesis version had animated characters designed by Disney’s artists, giving it a greater visual impact that was even complimented by the director of the Super Nintendo game, Shinji Mikami. 30

That these elements of games can be enjoyed as separate works or understood as unique selling points by the games’ audiences, points to an understanding, even an informal one, of assets as distinct works within a game. We can call this understanding a *collected work theory* of games criticism, as it describes how games are collections of distinct artworks that are juxtaposed (through game engine software and scripting) to create interactive experiences. While uncommon in the world of academic
game studies, some analyses inch close to it by acknowledging the craft of how game designers compose the experiences they make, even when treating the game as individual works. In Roberto Dillon’s reaction to the MDA Framework, the AGE framework, standing for “actions,” “game-play,” and “experience,” he uses “experience” to describe how the act of playing games makes players feel a variety of emotions. In focusing on “experience” rather than the vaguer “aesthetics,” he provides a metric for addressing the elements of fine art that evoke human emotion such as a work’s composition or color palette. In a later article describing a study where observers compared the emotions evoked by games and works of art, participants could describe their engagement with works in terms of both aspects that would apply to a work in general (“immersion”), but which could also apply to individual game elements (“color appreciation”).

At first glance, collected work theory is friendlier to game enthusiasts or industry professionals, since they more closely align with how these groups describe games, than audiences unfamiliar with games. However, audio-visual elements games have historically acted as ambassadors for the games medium when enjoyed separately from the games themselves. Concerts of game music from Final Fantasy or the Legend of Zelda series, for example, are now common at concert halls and have made positive impressions with classical music enthusiasts. Collected work theory is also present in some museum exhibitions of video games. This mindset is very apparent in how design museums such as the Victoria and Albert (V&A) Museum in London show works: their 2018 exhibit Videogames: Design/Play/Disrupt showed not only games but also the planning documents, designers’ notebooks, office bulletin boards, and assets that went into creating them. The Akron Art Museum in Akron, Ohio, USA, likewise included works that could be said to acknowledge collected work theory in their exhibition Open World: Video Games & Contemporary Art. The works Dataset Diptych 01 and Dataset Diptych 06 by artist Alan Butler show images of the realistic homeless non-player characters from Grand Theft Auto V. The purpose of the work is to highlight the problem of homelessness by showcasing how creating a believable city in a video game requires creating a believable homeless population. The images are accompanied by works showing all of the texture image files, numbering in the dozens, used to create the characters; shown to expose the effort that goes into their creation. While the assets are shown to make a social point according to the affordances of contemporary art, the extraction of game assets shows the potential of collected work understandings of games.
Collected work theory readily provides avenues for studying games in the context of other art and media forms as one would analyze the visual art, music, and other elements of games according to discipline-specific criteria from those fields. In the case of a game like *Cuphead*, the game’s animations and visual assets must be evaluated against the principles of animation—anticipation, appeal, timing, and so forth—as laid out by animators Frank Thomas and Ollie Johnson. Collected work theory also makes it easier to find aesthetic precedents for games beyond the games medium itself. The scores of several *Dragon Quest* games, for example, are better appreciated when one considers that among composer Koichi Sugiyama’s key influences is Johan Sebastian Bach.

As with any artwork, the collected works within games can be said to singularly evoke emotional responses through color theory, the key of the music, or other aspects of their creation. This is where critics must be cautious with collected work theory and using it to analyze games according to the affordances of other forms of art. Games’ interactivity may change how these assets are encountered or juxtaposed, thereby changing their meaning. In *Lissitzky’s Revenge* (Figure 9.1a–c), a game based on Bolshevik designer El Lissitzky’s 1920 poster *Beat the Whites with the Red Wedge*, players can move the elements of the original poster—a red triangle, white...
circle, and black and gray squares—around the screen. This creates a game where a screenshot may be taken at any time to create a new Constructivist artwork, though not with the poster’s original propagandist intent unless its composition is recreated exactly by the player.36

9.2.3 Levels as Unique Works of Game Design
The individual levels of video games fall into an unclear area: are they individual assets or holistic works of game design? Should we appreciate them through single work theory or collected work theory? Levels are not singular assets but often a collections of assets, geometry, and colliders—invisible masses that perform functions within a game engine’s physics system such as create barriers—arranged in such a way that they create interesting gameplay situations and emotional responses.37 In this way, they are like games, and in fact, many industry observers see level design as a subfield of game design.38

Within the file systems of many game engines such as Unity though, levels are also treated as individual scene files which can be called and managed like an individual asset. Through efforts such as the GDC Level Design Workshop, World of Level Design,39 the Level Design Lobby Podcast,40 and others, practicing level designers are trying to establish the field as a related, but distinct, field from game design itself with its own set of critical discourse and principles. This would seem to point to their appreciation as separate entities from the games with which they are associated.

This is where architecture can be a useful lens for understanding game levels. As with the single work theory of games criticism, a level might be understood as a singular work with a distinct effect as with the metaphor of a church used previously. Like such a church, let us say a thirteenth-century French gothic church, its individual elements can also be appreciated for the way that they contribute to the summative effect. The church’s sense of lux nova, meant to create an ethereal feeling as though the occupant was encountering God, can be understood through appreciation of the church’s rose windows that filter external light through colored glass to create this unique effect. These windows are themselves both individual assets within the church’s structural system and contributors to the holistic experience of being inside the structure.

Levels can be seen as merely emblematic of the games of which they are an element, and indeed their design can be a useful metric for evaluating the quality of a whole game design. However, seeing them as unique works within games or even as collected works themselves which use assets to
create specific effects allows us to tap into a wealth of knowledge from disciplines outside of games, notably architecture. As a field of design itself, architecture may also have things to teach practicing game designers about approaching their work as products of design. In the next section, we will explore an architectural approach to viewing design problems, and how it might be used to incorporate the knowledge of disciplines outside of games into game works.

9.3 DESIGN THINKING FOR GAMES

While I was in architecture school, my instructor Matthew Geiss described his favorite thing about being an architect: “If I’m doing, for example, a hospital project, I get to learn about doctors and what they do during their day, and how to make it easier.” This mindset was similar to what our other professors would describe as design thinking, where disparate bodies of knowledge are synthesized by a designer into a product or solution. In the years since, design thinking has as a term become popularized by the Stanford Design School (D.School) and the IDEO Design Consulting Company. The core of their methodology is a toolkit meant to walk students through a process of thinking where they (1) discover facts about a design problem or question (empathy), (2) find the problem (define), (3) conceptualize potential solutions (ideate), (4) build one of the potential solutions (prototype), and (5) evaluate efficacy (test).

Critics of the process have pointed out that it is not entirely a new idea. As Stanford instructor Jonathan Kleiman has admitted, “The ideas, the methodology—they’re not that novel. What’s radical about design thinking is the way that it’s been packaged into something really attractive and accessible.” Indeed, the method as presented greatly resemble research-heavy early stages—client meetings, site analysis, definition of the included features that a design must have, and so on—that architects call “pre-design,” followed by an iterative design process that greatly resembles the scrum methodology. Whether a reader is swayed by the buzzwords and branding, a 2018 study found that the method succeeds in improving engagement when used in classroom settings and leads students to become better at identifying design problems, spend more time researching problems, and experimenting with varied solutions.

9.3.1 Empathy and Pre-Design

Digging into Stanford’s design thinking literature reveals that it resembles a more formalized version of the architect’s design thinking as extolled by
my own instructors. Listed among the “8 core abilities” of design thinking are “learning from others,” “synthesizing information,” and “experimenting rapidly.” These greatly resemble the discourse on architectural design thought mentioned early in this section and iterative prototyping of the scrum methodology practiced by many game studios.

Matthew Geiss’s notion of learning about a client’s daily activities and making decisions based on making a space most usable by them is similar to the “game designer as advocate for the player” mindset championed by game designer Tracy Fullerton. Even interactivity concepts like the core mechanic, the “essential play activity players perform again and again in a game,” stem from the player’s use of the game. Schell Games designer Sabrina Haskel Culyba, in her book The Transformational Framework, places “audience & context,” “player transformations,” and “barriers for player learning,” among the first things designers of educational games must identify in their work.

Regardless of other reasons that a game project is started or its goals—a novel new mechanic, interesting technology, an epic story, real-world transformation, or making money—player experience is (or should be) a central consideration if the game is to create a satisfying experience (Figure 9.2). This client/player-centric approach is key to design thinking and can be utilized to set aesthetic goals for many aspects of a game. For example, a core goal of Lissitzky’s Revenge was to emulate the art style of

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**FIGURE 9.2** A graph showing different points from which a designer’s initial idea for a game could occur. Lines on the graph interconnect with any other point, showing how most games share several of these criteria. Though many designers highlight one of the outer criteria, player experience must be central if the game is to be satisfying.
Lissitzky’s famous poster, but turning abstract art into an understandable game involved a long process of *playtesting*, having your audience play the game, and responding to feedback.

Looking at the process from a macro-level, empathy-based design criteria is one tool among others to help create meaningful gameplay and can be used in concert with the skills of “synthesizing information” to form a rich research base for a game project. Among his pre-design analysis methods for architects, Yatt defines “program analysis” as identifying the spaces that should exist in a building based on the needs of the client’s daily activities. For example, most houses likely need a “living room” space for occupants to gather, a kitchen for food storage and preparation, bedrooms, and bathrooms. An architect might find out that their client also makes pottery, and a studio space for the client’s wheel and kiln, identified when the architect researches pottery-making, might become a vital aspect of that house’s program. Other parts of pre-design analysis also come into play to influence the eventual design of such a house, including zoning laws, fire codes, geographic and environmental site conditions, and other *constraints* that define what the building can be. The resulting structure will reflect all these requirements: empathetic criteria for the client, responses to design constraints, and aesthetic or style goals.

### 9.3.2 Architectural Design Thinking as Research for Game and Level Design

Used together, collected work theory and design thinking can help game designers form rich project goals that apply to not only a game’s high-level interactivity, but also levels and assets. From an analysis perspective, this gives us the ability to define aesthetics for game assets or sections (such as levels) with influences from fields such as architecture for use in game studies works or exhibitions.

#### 9.3.2.1 Design Thinking for Analysis Criteria

This was done for the 2018 SAAM Arcade at the Smithsonian American Art Museum, which featured games with interesting use of the concept “Game Spaces.” This event showcased games that featured game levels that included novel game mechanics or which were particularly responsive to player needs, used the space around the game itself in a unique way, or which inspired a social space or community. Despite using a broad definition of “game space” so to include contemporary “serious game” trends, the level design portion of the event allowed organizers to develop a rich
system of aesthetic considerations on which to judge game levels. Included in these criteria were use of architectural forms, shape theory, and color theory (among others) to draw player attention and guide them through spaces. Since the event’s organizers had focused on an element of games to highlight instead of games as holistic objects, judging criteria could be based on concepts that influenced those elements. Though not explicitly stated in the submission criteria for games, the criteria on which levels would be judged were guided by architectural spatial usability principles.

Mark Mayer’s Desolus was such a game that exemplified these criteria: players must travel back and forth between different versions of a space in different “dimensions” to progress. Each dimension had different color schemes which contrasted with one another so that, for example, a portal to a purple-colored dimension would stand out when viewed from the orange-colored dimension. Points of interest in these levels were also placed in such a way as to draw player attention, with level geometry used to form sight lines or frame important areas.

9.3.2.2 Design Thinking for Planning Game Design and Art Goals
Such thinking is vital to games with experimental art styles or those with art history inspirations, such as the aforementioned Lissitzky’s Revenge and the upcoming Little Nemo and the Nightmare Fiends. The latter game is based on the public domain comic Little Nemo in Slumberland by comic and animation pioneer Winsor McCay and bases its visual style on McCay’s original strip. The early design phases for this game therefore included establishing unique criteria for the different aspects of the project: designers identified the experiential goals of the game through defining game mechanics, artists developed the pipeline of software processes that would allow them to recreate McCay’s artwork, and so forth. Again, design goals could be established down to the asset level and based on pre-design research: character sprites needed to integrate the “art nouveau line” indicative of McCay’s drawing style, traditional animation principles, and the half-tone printing look of newspaper comics (Figure 9.3).

Nemo’s level design is also the product of design thinking information synthesis. Visually, the environments must resemble McCay’s mastery of drawing neoclassical and beaux arts-style architecture exemplified by the buildings of the 1893 Columbian Exposition in Chicago. In level design terms, the game’s levels must be responsive to the player avatar’s movement capabilities and other gameplay mechanics, but also reference the unique layouts of McCay’s comics (Figure 9.4a and Figure 9.4b).
9.3.2.3 Design Thinking Applied to Non-Architectural Works

This process does not have to be for visual arts alone or even have explicit connections to architecture. Another game, *La Mancha,* was based on Miguel de Cervantes’ novel *Don Quixote* and featured gameplay mechanics and player interactions deeply influenced by the original novel (Figure 9.5).

The novel tells the story of Alonso Quijano, an old man who declares himself a knight named Don Quixote after reading too many books about chivalry. The design for *La Mancha* was begun by analyzing the action within the novel to discover what type of gameplay would best allow players to “become” Don Quixote. Don Quixote and his squire Sancho Panza embark on knightly adventures, interpreting the mundane world around them through the lens of chivalric texts. Therefore, the game became one where players compete at telling stories made up of cards with quotes from books of chivalry.

Design empathy was incredibly important in this project, as much of its potential audience, and indeed many of its playtesters might be unfamiliar with the (992 page) original novel. Great care had to be taken to carefully
FIGURE 9.4A The *Little Nemo in Slumberland* episode from June 7, 1909, where Slumberland rises from beneath the ground, was inspiration for a piece of level design concept art for *Little Nemo and the Nightmare Fiends*. McCay’s original comic uses the comic’s frames to show Slumberland’s rise over the course of several seconds of action. The same mindset was used in the concept art where frames are used to show a potential level where a building rises from the ground while players must avoid being pushed off the screen as the action moves over time and the player characters dodge obstacles. Zoomed out, the concept art comic also showcases an elevation drawing of a neoclassical building, based on the Minnesota Building from the 1893 Columbian Exposition. While this exact composition would be difficult to emulate on most 16:9 ratio screens, designing level action and geometry compositions on these comic layouts became a design goal. (From McCay, W., 1909. *Little Nemo*. Available at: https://www.comicstriplibrary.org/display/548.)
write story prompt cards and the game’s chivalry cards so they could be clear to players who had not read the book. This process included defining the roles that each player would adopt in each story prompt or providing explanatory text on cards with specific character or place names. Again, empathy for the needs of players, pre-design, and information synthesis were vital for editing individual game elements (in this case cards) and creating an effective overall game.
9.3.3  Level Design as an Architectural Process

This all returns us to architecture and level design. As we have seen, seeing games not only as holistic objects of art and design, and instead as works made up of a collection of other artworks, allows us to focus analyses at different levels of specificity. If we home in on levels as individual works, regardless of whether they are made of specific level assets, we can form a set of criteria for appreciating them. Design thinking is a process through which this can happen. It allows us to see how works of art and design respond to the needs of users and can be the result of information gathering (pre-design research) and syntheses of information from different disciplines into a coherent work.

Games utilize space and architecture in different ways, but primarily as either an asset as in the case of strategy games, as a space “looked into” as in the world maps of Japanese role-playing games, or as inhabitable space. For architecture and level design, it is “inhabitable space” which is the most important.

Focusing on levels as both individual works and as inhabitable space gives us access to a wealth of knowledge from fields like architecture that

FIGURE 9.5  An image of La Mancha, a storytelling card game based on Don Quixote in which design thinking and player empathy was vital for condensing the 992-page novel into a playable and entertaining game.
form classical disciplines for making and appreciating inhabitable space. Indeed, the day-to-day work of a level designer greatly resembles the work of an architect, down to how their tools—game engines, Computer Aided Drafting (CAD), and Building Information Modeling (BIM) programs—render space on a computer screen. The definition for level design given in *An Architectural Approach to Level Design* is “the thoughtful execution of gameplay into gamespace for players to dwell in.” This definition contrasts others, such as Kremers’ statement that “level design is applied game design,” by adding the player to the mix. From here, the level designer can look to the work of architectural theorists who focus on human-centric spatial design theory such as Christopher Alexander, Lyndon and Moore, Jane Jacobs, Grant Hildebrand, and others whose work accounts for human activity and perception.

Under design thinking, the design criteria for a level might include the aforementioned aesthetic goals listed in projects like Lissitzky’s *Revenge* or *Little Nemo and the Nightmare Fiends*, but may also include memory limits, point-of-view, how engines handle lighting, and other considerations. The level designer practicing design thinking takes the purpose or core mechanic of a level into account as a way to incorporate player empathy into their design: does the level have a theme? Should the placement of level geometry test the player’s mastery of their character’s movement capabilities by placing objects at the limits of these capabilities or should the level be easier to navigate? Likewise, this designer looks at how individual assets create a system of communication used to help a player through a level and contribute to an overall atmosphere. As with *Desolus*, aspects of individual assets such as shape, form, color, and others allow designers to make objects contrast one another to draw the eye. Lighting and sound can be further added to enhance the atmosphere of a level: friendly, mysterious, dangerous, and so forth.

Finally, such a designer wants to know if any of their designs actually work the way they anticipate. Tracy Fullerton and other game designers champion the process of paper prototyping or reproducing digital game environments on paper as though for a board game to test simple mechanics before spending time making them on a computer. This is like the architect’s process of sketching and putting ideas quickly on paper so a client can choose from a bevy of concepts before design proceeds. Next is the process of grayboxing, where geometry is built quickly with basic forms (often shown in game engines as gray boxes) to test broad level design ideas. This occurs early in the process after a design has been translated onto a
computer and allows the designer to further iterate without committing time and effort into producing visually polished scenes. Such testing is a process of putting games in front of players, quietly observing their play, and listening to their feedback after the test. Through this process, the level is further and further refined until the level’s intended goals are realized.

9.4 SUMMARY

Beyond merely studying the way in which architecture and space are represented in games, architecture and spatial design have a lot to show game designers. Level design has historically been a challenging area for designers and critics, but this is because a new approach to game criticism that focuses on games as collected works rather than singular works is necessary. Breaking games into their component parts allows understandings such as architectural studies of game levels to exist and unlocks processes, such as design thinking, that come from outside of games. In this chapter, we have investigated perspectives and mindsets that I hope will aid readers in their own work with game design and analysis.

It should be stated that these are connections that I can make, through my training in design thinking, that come from my particular background in architecture. Now I have a challenge for you, dear reader, to find the areas of your own background and expertise that influence games, game design, game art, sound, music, or other works within games. As a relatively young field, we have not yet exhausted the knowledge that, with the right perspective, could be the next breakthrough in our ability to understand our work.

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