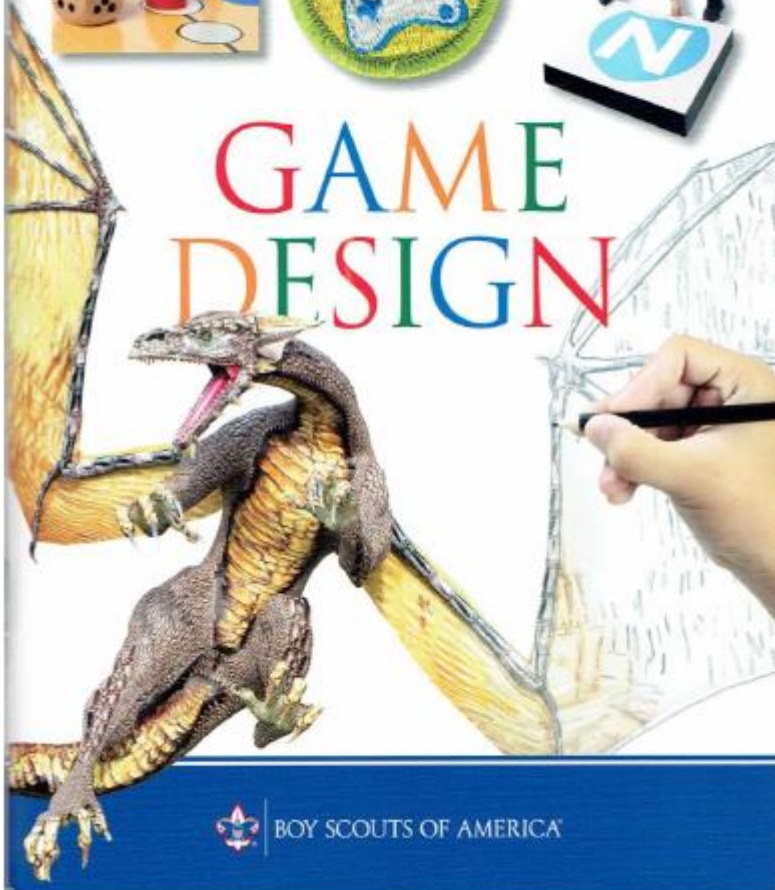


MERIT BADGE SERIES



GAME DESIGN



BOY SCOUTS OF AMERICA

HOW TO USE THIS PAMPHLET

The secret to successfully earning a merit badge is for you to use both the pamphlet and the suggestions of your counselor.

Your counselor can be as important to you as a coach is to an athlete. Use all of the resources your counselor can make available to you. This may be the best chance you will have to learn about this particular subject. Make it count.

If you or your counselor feels that any information in this pamphlet is incorrect, please let us know. Please state your source of information.

Merit badge pamphlets are reprinted annually and requirements updated regularly. Your suggestions for improvement are welcome.

Send comments along with a brief statement about yourself to National Advancement Committee, S209 • Boy Scouts of America • 1325 West Walnut Hill Lane • P.O. Box 152079 • Irving, TX 75015-2079 • merit.badge@Scouting.org.

WHO PAYS FOR THIS PAMPHLET?

This merit badge pamphlet is one in a series of more than 100 covering all kinds of hobby and career subjects. It is made available for you to buy as a service of the national and local councils, Boy Scouts of America. The costs of the development, writing, and editing of the merit badge pamphlets are paid for by the Boy Scouts of America in order to bring you the best book at a reasonable price.



BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

GAME DESIGN



"Enhancing our youths' competitive edge through merit badges"



BOY SCOUTS OF AMERICA

Note to the Counselor

The project portion of the Game Design merit badge gives Scouts flexibility to work with a medium of their choosing. The level of effort required to make a game in different mediums can vary significantly. However, the requirements define what each Scout must include in his design notebook so that there is a baseline for all Scouts to meet.

The notebook must demonstrate a thoughtful initial concept, multiple design iterations based on initial testing, and feedback from blind testing. Encourage Scouts to use their notebook to record brainstorming sessions, test parameters, and any game-related ideas throughout the process. Also encourage them to record thoughts behind key design decisions to help them trace and retrace their steps as their designs evolve.

Before a Scout begins the prototyping phase, *he must have counselor approval for his design concept*. The counselor must make sure that he has put enough effort into the concept phase to have a good foundation for the prototype phase. Watch out for overly ambitious projects that could lead to unnecessary frustration. It is important to understand that the Scout is making a *prototype*. The challenge of the project is to develop and experiment with gameplay, not to develop extensive programming skills, create beautiful artwork, or spend a lot of time fabricating components.

When prototyping, Scouts should devote most of their energy to assessing and improving the play experience. With each iteration, Scouts should identify game elements that they want to change and how the changes will alter the play experience. After making changes, they then test the game and evaluate whether or not the changes had the desired outcome. It is acceptable for the final prototype to be very different from the initial concept, provided that the notebook shows the progression.

Because the project is so flexible, it is likely that you will have Scouts working in mediums with which you are unfamiliar. The game design community has a vast array of publicly available resources, and the merit badge information online at www.scouting.org maintains updated links to relevant material. If you have a specific concern about programming an electronic game prototype, there are a number of free

or inexpensive game design software packages available online. Some are very easy to use with little or no computer knowledge, and most have robust information resources to support them. See the resources section at the end of this pamphlet.

The merit badge includes many opportunities for teamwork and group play. Group participation is mandatory to complete requirement 7, but all of the other nonproject requirements also work well in collaboration. Note, though, that each Scout must deliver his own game prototype to complete the project. This ensures that every Scout has the chance to develop and use the critical thinking skills that are part of testing and design iteration. If they want to collaborate on their projects after completing the requirements for the badge they are encouraged to do so, but that is beyond the scope of this badge.

The Game Design merit badge relies heavily on specific terminology. Because game design is broad and game analysis is relatively young, there are few established definitions in the industry. Please refer to the glossary at the end of this pamphlet for definitions applicable to the pamphlet and requirements. For additional questions, refer to the merit badge website and the resources listed at the end of the pamphlet.



Requirements

1. Do the following:
 - a. Analyze four games you have played, each from a different medium. Identify the medium, player format, objectives, rules, resources, and theme (if relevant). Discuss with your counselor the play experience, what you enjoy in each game, and what you dislike. Make a chart to compare and contrast the games.
 - b. Describe four types of play value and provide an example of a game built around each concept. Discuss with your counselor other reasons people play games.
2. Discuss with your counselor five of the following 17 game design terms. For each term that you pick, describe how it relates to a specific game.

Thematic game elements: *story, setting, characters*
Gameplay elements: *play sequence, level design, interface design*
Game analysis: *difficulty, balance, depth, pace, replay value, age appropriateness*
Related terms: *single-player vs. multiplayer, cooperative vs. competitive, turn-based vs. real-time, strategy vs. reflex vs. chance, abstract vs. thematic*
3. Define the term *intellectual property*. Describe the types of intellectual property associated with the game design industry. Describe how intellectual property is protected and why protection is necessary. Define and give an example of a licensed property.
4. Do the following:
 - a. Pick a game where the players can change the rules or objectives (examples: basketball, hearts, chess, kickball). Briefly summarize the standard rules and objectives and play through the game normally.
 - b. Propose changes to several rules or objectives. Predict how each change will affect gameplay.
 - c. Play the game with one rule or objective change, observing how the players' actions and emotional experiences are affected by the rule change. Repeat this process with two other changes.

- d. Explain to your counselor how the changes affected the actions and experience of the players. Discuss the accuracy of your predictions.
5. Design a new game. Any game medium or combination of mediums is acceptable. Record your work in a game design notebook.
 - a. Write a vision statement for your game. Identify the medium, player format, objectives, and theme of the game. If suitable, describe the setting, story, and characters.
 - b. Describe the play value.
 - c. Make a preliminary list of the rules of the game. Define the resources.
 - d. Draw the game elements.

You must have your merit badge counselor's approval of your concept before you begin creating the prototypes.

6. Do the following:
 - a. Prototype your game from requirement 5. If applicable, demonstrate to your counselor that you have addressed player safety through the rules and equipment.
 - b. Test your prototype with as many other people as you need to meet the player format. Compare the play experience to your descriptions from requirement 5b. Correct unclear rules, holes in the rules, dead ends, and obvious rule exploits. Change at least one rule, mechanic, or objective from your first version of the game, and describe why you are making the change. Play the game again. Record whether or not your change had the expected effect.
 - c. Repeat 6b at least two more times.
7. Blind test your game. Do the following:
 - a. Write an instruction sheet that includes all of the information needed to play the game. Clearly describe how to set up the game, play the game, and end the game. List the game objectives.

- b. Share your prototype from requirement 6 with a group of players that has not played it or witnessed a previous playtest. Provide them with your instruction sheet(s) and any physical components. Watch them play the game, but do not provide them with instruction. Record their feedback in your game design notebook.
 - c. Share your game design notebook with your counselor. Discuss the player reactions to your project and what you learned about the game design process. Based on your testing, determine what you like most about your game and suggest one or more changes.
8. Do ONE of the following:
- a. With your parent's permission and your counselor's approval, visit with a professional in the game development industry and ask him or her about his or her job and how it fits into the overall development process. Alternately, meet with a professional in game development education and discuss the skills he or she emphasizes in the classroom.
 - b. List three career opportunities in game development. Pick one and find out about the education, training, and experience required for the profession. Discuss this with your counselor. Explain why this profession might interest you.



6 GAME DESIGN



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What Is Game Design?

For thousands of years, in every culture, across every part of the globe, people have played games. Games challenge us to overcome long odds, tell compelling stories, and allow us to work with or against one another. They give structure to play. Games motivate us to find creative solutions, practice new skills, and spend time with others.

Games also come in almost every shape, size, format, and flavor imaginable. Games can be fast-paced, slow, or anything in between. Some are competitive. Some are cooperative. They may be for individuals, small groups, or thousands of players at a time. They might take seconds to complete or last for years. However you slice it, everyone has played games, and games help make us who we are.



Game design is the process of creating the content and rules of games. Along the way, game designers take on many different roles.

- **Builders** make worlds to explore.
- **Engineers** make systems and mechanics that link together into a complete picture.
- **Scientists** test new ways to improve the play experience.
- **Teachers** teach players what to do and how the rules of the game work.
- **Dreamers** create new, unique, amazing experiences.



Game Design Goals

1. Fun
2. Interactive
3. Social
4. Easy to learn
5. Hard to master
6. Manageable in scope and time
7. Well-paced
8. Immersive
9. Replay value
10. Affordable

—Pete Fenlon, Eagle Scout and chief executive officer, Mayfair Games

What Is a Game?

Even though games are everywhere, "game" is a tricky word to define. Here are a few common traits of most games.

1. Games are a form of play. Most games are played for recreation, others are played by amateurs and professionals alike, and some are even used as tools for training and education.
2. Games have objectives or goals that players work to achieve.
3. Games have rules. Rules govern the components of the game and the ways that players interact with those components and each other.
4. Games have feedback. As players work toward their goals, the game provides information about how they are doing. Scores are a form of feedback.
5. Games have challenges. In the vast majority of games, the rules, other players, or other elements impede player progress toward the objectives.
6. Games employ a variety of skills. These include physical abilities, communication, strategic thinking, patience, observation, and problem solving.
7. Games present choices. Players make meaningful decisions in order to affect game outcomes.
8. Games are participatory. Unlike many other forms of entertainment, games are not just about observing. They are about taking action.



History of Games Timeline

Year	Game	Medium	Comments
5200 B.C.	Bocce	Physical/ Sport	Egyptian hieroglyphs depict a rock-throwing game that became the origin of bocce and bowling.
3500 B.C.	Senet	Board	An Egyptian tomb housed the pieces of the first known board game.
3000 B.C.	Dice	Dice	These randomizing tools first appeared in India and have been found alongside early backgammon sets. Sheep knuckle bones were used by other cultures for dice-like games.
2000 B.C.	Polo	Sport	The Persians developed this horse-riding game to train their cavalry.
1400 B.C.	Ulama	Sport	Throughout Latin America, temple ruins can be found for a Mayan game played with a rubber ball.
600	Chatrang	Board	This Indian board game was the origin of checkers and chess.
1100	Handball/ Racquetball	Sport	French monks developed an indoor handball game that later evolved to include a racket.
1250	Dominoes	Tile	This tile game, related to dice games, originated in China.
1457	Golf	Sport	The Scottish parliament banned golf to keep troops from getting distracted during archery practice.
1529	Trump	Card	This English trick-taking game later evolved into bridge, euchre, and hearts.
1630	Lacrosse	Sport	When Europeans reached North America, they witnessed natives playing this team stickball game.
1791	Baseball	Sport	The first known American reference to our future national pastime was a law prohibiting it near the town meeting house in Pittsfield, Massachusetts.
1800s	Conquian (Rummy)	Card	The ancestor of rummy, this game of card sequences was played in Latin America.
1848	Charades	Party	The novel <i>Verity Fair</i> described this party game of acting and guessing.
1891	Basketball	Sport	This sport was developed by Dr. James Naismith to provide indoor physical activity for his gym class.
1913	Little Wars	Miniatures	The first set of rules for civilians to play with toy soldiers was written by H.G. Wells.
1934	Monopoly [®]	Board	The modern form of <i>Monopoly</i> , first published in 1934, was based on The Landlord's Game of the early 1900s. It struck a chord in impoverished Depression-era America.

Year	Game	Medium	Comments
1938	Scrabble [®]	Tile	The word tile game was first created in 1938, but it was not successfully sold to a manufacturer until 1952.
1966	Yahtzee [®]	Dice	This dice-throwing game from Milton Bradley was a commercial iteration of the earlier games <i>Yacht</i> and <i>Generals</i> .
1966	Twister [®]	Party	The colorful classic party game was patented in the mid-60s.
1972	Pong [®]	Electronic	The first electronic game to reach main-stream popularity, the table tennis simulation was originally meant to be a training project for a new engineer at Atari.
1974	Dungeons and Dragons [®]	Text-based RPG	The first text-based role-playing game created a new form of interactive storytelling.
1980	Pac-Man [®]	Electronic	Providing the first iconic video game character, <i>Pac-Man</i> was the highest-earning arcade game in history.
1984	Tetris [®]	Electronic	This colorful puzzle game was first released on the personal computer but has since spread to game consoles, calculators, cellphones, and many other devices.
1985	Super Mario Bros. [™]	Electronic	This side-scrolling platform game helped launch the home game console market and Nintendo [®] .
1987	Warhammer [™]	40,000 Miniatures	Players assemble and paint futuristic figurines and face them against one another in this war game.
1993	Magic: The Gathering [®]	Card	Its gameplay became the model of many collectible card games, and new content continues to be released 20 years later.
1996	The Settlers of Catan [®]	Board	One of the first Eurogames to sell well outside of Europe, <i>Catan</i> became a gateway for bringing players to modern tabletop games.
1998	The Legend of Zelda [™] : Ocarina of Time [™]	Electronic	The combination of storytelling, mechanics, art direction, and technical power made this one of the best-regarded electronic games in history.
1999	Counter-Strike [®]	Electronic	A user-created modification to the shooter <i>Half-Life[™]</i> , it became a mainstay of professional electronic gaming.
2004	World of Warcraft [®]	Electronic	The largest massively multiplayer game in the world; at its peak it had 12 million subscriptions.
2009	Angry Birds [™]	Electronic	With more than a billion downloads by June 2012, this puzzle game has redefined the way people interact with phones and other mobile electronic devices.



Game Mediums

To think like a game designer, it is useful to analyze games that you play or know about. Thinking about how games work, grouping them based on similarities and differences, and learning a common set of words to describe games will give you tools for making your own games. One obvious way to categorize a game is by medium, or the form of the game. Newspapers, magazines, and books are different printed media. In the same way, games can be described by the shape they take and the way players interact.



Physical Games and Sports

The oldest recorded game in history was a ball game played in ancient Egypt. Ball games and sports are physical, typically competitive games, as are other games like capture the flag. These games involve athletic activities and are played with special equipment like balls, nets, or sticks. Generally, the gameplay revolves around one or more specific physical actions.

and the objectives reward players who most skillfully perform those actions. Basketball, for example, is built around dribbling, passing, and shooting the ball. The shape and details of the field of play are an important part of the game design. Rules and objectives are frequently related to specific portions of the field.

When designing a physical game or sport it is essential to consider safety. Rules and mechanics should enforce safe play, and protective equipment should be used to reduce risk.



Board Games

Also dating back to ancient Egypt, board games usually involve placing and moving pieces on a game board. They come in a variety of gameplay types including:

- Abstract games in which the board is divided into regular spaces and the players typically compete to claim pieces or spaces. Examples include checkers, chess, and go.
- Territorial strategy games like *Risk*[®] where the board is a map with distributed resources and attributes.
- Race-to-the-end games where players race along a linear track. *Candy Land*[™] is one such game.
- Building games where players compete to reach construction objectives. In *Ticket to Ride*[™] players try to earn the most points by building train connections between cities.

Eurogames, or German board games, are a broad category of modern games that originally flourished in Europe. They emphasize strategy over chance and often have multiple victory conditions or paths to win.



Tile Games

Tile games are played with a limited set of tiles (usually rectangular) that may contain pips (dots), letters, or special symbols. Play consists of players placing one or more tiles from their hand adjacent to those already placed and then replenishing their hand with new tiles (if available). Scoring is usually performed when tiles are played. Dominoes, *Carcassonne*[™], and mahjong are all examples of tile games.

Dice Games

Dice are often used to introduce chance into other types of games and can also be the primary focus. Some games, such as *Yahtzee* and *Bunco*[®], use standard six-sided dice (abbreviated d6). Others, such as *Boggle*[®] or *Cosmic Wimpout*[™], replace the dots with letters or special symbols. Dice games can usually be played by any number of players, with the dice being passed from player to player. A "turn" calls for the player to roll the dice once or multiple times, depending on the game and prior rolls. Games are typically scored, with the various combinations of dice having a specific scoring.





Card Games

Card games are played with sets or “decks” of cards. Generally, the order of the deck is unknown. Cards are mixed or shuffled by the players at the beginning of the game. This randomization creates suspense, uncertainty, and surprising situations to which players must react. Information is communicated to the players by symbols or writing on the cards, which can be on one or both sides of the card.

Many card games use a standard playing card deck of hearts, diamonds, spades, and clubs. Hearts, rummy, and solitaire are well-known examples. Collectible or tradable card games are another common form of card game. *Magic: The Gathering* is the earliest example. In these games, players build their own deck with only a small portion of the complete deck. Each player’s deck is typically used to achieve the game outcome through a particular strategy, based on how the decks compare with one another.

Party Games

Most board and card games are for no more than six players. Party games are generally for four to 12 or more players and often arranged in teams. Because they are meant for larger social situations, the gameplay emphasizes interaction between players and typically involves some form of creativity. Drawing, acting, singing, and giving word clues are all common activities in party games. Trivia games also typically fall into this medium.



These games may include boards, cards, and dice, but they are distinguished by the player format and play experience. The party game designer places special emphasis on making gameplay that is fun for players and observers, easy to join, and encourages participation from everyone at the event. Party games include charades, *Twister*[®], *Trivial Pursuit*[®], *Cranium*[™], *Morphology*[™], *Pictionary*[®], and *Jenga*[®].

Games With Miniatures

Miniature games are played with small, detailed models of pieces and terrain. Originally, they were used to teach and experiment with military tactics and strategy. Miniature gaming as a hobby emerged in the early 20th century, in large part because the H.G. Wells book *Little Wars*, which set forth rules for playing with toy soldiers.

Today, miniature game settings include historical reenactments, fantasy, and science fiction. The gameplay may focus on just a few or many pieces. Most miniature games are turn-based. This style of gameplay has contributed to the design of many board and electronic strategy games. Miniatures are also commonly used in tabletop role-playing games to act out the action.

There are several important questions to consider when designing a miniature game.

- Is this a recreation of a historical battle or a more free-form adventure?
- What scale of minis will be used?
- Does a figure represent a single soldier or a full unit?
- How big does the model terrain need to be to match?
- How will players track unit statistics and measure movement?



Text-Based Role-Playing Games (RPGs)

This game medium can be most easily described as interactive storytelling. A ruleset or system is used to define the gameplay, but the game's objectives may change during play. The end point of an RPG campaign—a complete story arc—is often flexible.

Players take on the roles of distinct characters within a fictional setting and then take actions based on the capabilities of those characters. Typically, these capabilities increase over time, as the characters practice skills, acquire knowledge, or obtain equipment. This allows players to take on progressively more challenging game scenarios. The most well-known RPG is *Dungeons and Dragons*.

Gamers call
role-playing
games *RPGs*.



Computer-generated dungeon

In most RPGs, one player serves as the gamemaster (GM). This player is the moderator and primary storyteller of the game. The GM determines the setting and rule system of the game, takes on the role of the environment and any non-player character (NPC), helps the players create their characters, and provides the initial game objectives. A GM is like the host of a party: He or she cooks the food, sets the table, and provides different choices for entertainment. The GM is not in charge but is in the game to give the players a compelling experience.

Once the campaign is under way, the players choose the actions they want to take, game mechanics determine whether their actions succeed or fail, and the GM determines the effect of those successes and failures. He then moves the story forward. A good GM keeps all the players engaged, uses a strong imagination to begin the story and react to the players, and maintains a moderate level of game balance. In electronic role-playing games, the GM role is usually played by the game software.

Role-playing games typically have strong themes, narratives, and character advancement, and unique gameplay elements. Text-based and miniature-based role-playing games—collectively called tabletop RPGs—are two forms of RPGs. These games are particularly strong in the following ways:

- **Control over the story**—The players and GM move the plot along as they see fit and are limited only by their creativity. Players take ownership of the stories in a deeply personal way.
- **Social interaction**—At their heart, tabletop RPGs are about hanging out with friends.
- **Problem solving**—Tabletop RPGs reward creativity and thinking “outside the box” to solve problems. This applies to both the players and the GM.
- **Customization**—Many game systems can be adapted to different game themes. Also, if you do not like a system, you can make any changes you want.



Electronic Games

Remember that whenever you participate in online game play with multiple players, you should first have your parent's permission to do so.

Electronic games are the largest-growing medium of games today. Almost every other game type could be implemented in an electronic form. Electronic games present information to players through video screens and audio signals. Players interact with the games through electronic sensors. Buttons, control sticks, and computer mice are common input devices. Newer technologies include touch screens, sensors, and cameras that respond to physical motion and detect a player's position and movements.

Electronic games are limited by the game hardware and fall into several categories: personal computer (PC) games, console games, and games for mobile devices. For example, PC games like *World of Warcraft*[®] typically use the mouse and keyboard for input. Console games like the *Super Mario Bros.* series use hand-held controllers.

As a game designer, think about the benefits and constraints of the mediums you want to work in. How do the players get information? What kind of actions can they take? What are they unable to do? How does the medium restrict you?

Gameplay is affected by medium, but it is not completely constrained by medium. Most forms of gameplay can be replicated in several different mediums, and mediums can overlap. For example, *Strat-O-Matic*[®] *Baseball* was first published in 1961 to recreate the sport of baseball as a board game. Many versions of chess can be played on computers. Electronic and card versions of the game series *Pokemon*[™] are both very popular. In each of these cases, some of the rules are exactly the same between the different mediums, and some of the rules have been changed to make the game functional.

Mediums can also be mixed together to utilize the advantages of each one. *Monopoly* is clearly a board game, but it also uses stacks of cards that can be mixed up and dice that add an element of chance to player movement.





Core Game Elements

Every game is built around four core game elements: **player format**, **objectives**, **rules**, and **resources**. A fifth element, **theme**, is also central to many games.

Much of the material in this section is based on Ian Schreiber's *Game Design Concepts Level 3: Formal Elements of Games*, found at <http://gamedesignconcepts.wordpress.com/2009/07/06/level-3-formal-elements-of-games>, and is used here under the Creative Commons license.

Player Format

Player format defines the number, arrangement, and alignment of players in a game. How many players does the game support? Must it be an exact number (four players only) or can the number vary (two to five players)? Can players enter or leave during play? How does this affect play? Are players on teams? Can teams be uneven? Do all the players on a team have the same objectives?

These examples of player structures is by no means a complete list.

Single-player (one player vs. the game system). Examples include any of the solitaire card games and the electronic game *Minesweeper*.

Head-to-head (one player vs. one player). Chess and go are classic board game examples.

Formats where players compete against one another are generally known as Player vs. Player (PvP). If the players are competing against the game or game elements, then the game is Player vs. Environment (PvE).

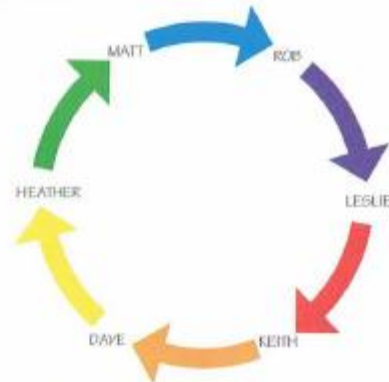
Cooperative or player vs. environment (PvE) (multiple players vs. the game system). This is common in online games like *World of Warcraft*[®]. Some purely cooperative board games exist too, such as *Pandemic*.

One-against-many (one player vs. multiple players). In the *Nintendo Land*[™] game *Luigi's Ghost Mansion*[™] for the Wii U[™] game system, one player takes the role of a ghost trying to scare the other players while they work together to trap the ghost with their flashlights.

Free-for-all (one player vs. one player vs. one player vs. ...). Perhaps the most common player structure for multiplayer games, this can be found everywhere, from board games like *Monopoly* to the basic mode in most competitive first-person shooter electronic games.

Team competition (multiple players vs. multiple players [vs. multiple players ...]; includes pair vs. pair). This is also a common structure, finding its way into most team sports, card games like bridge and spades, and outdoor games like capture the flag.

Predator-Prey. Players form a (real or virtual) circle. Everyone's goal is to attack the player on their left and defend themselves from the player on their right. The live-action game *Assassin* uses this structure.



Predator-prey player format

Objectives (Goals)

What are players trying to do? Game objectives determine who won or whether a player has beaten the game or a portion of the game. They can also vary in scale. *Complete the level or mission* is an objective, but the bigger objective might be *complete a series of levels or complete this storyline*. Here are some common game objectives.

Score: Get more points than your opponent as in soccer or get a lower score such as in golf. Alternately, be the first player to reach a particular number of points or, in a single-player game, get more points than you have before. In other cases, the game ends after a certain amount of time, and the best score wins. There might be more than one source of points, or individual actions might have different point values. The way that points are assigned can give game designers flexibility to adjust the play experience.

Capture/destroy: Eliminate all of your opponent's pieces from the game. Chess and *Stratego*[®] are well-known examples where you must eliminate opposing forces to win.

Collection: The card game rummy and its variants involve collecting sets of cards to win. Many electronic jumping and exploration games like *LittleBigPlanet*[™], commonly referred to as "platformers," require the player to collect a certain number of objects scattered throughout the levels.

Solve: The board game *Clue*[®] is an example of a game where the objective is to solve a puzzle.

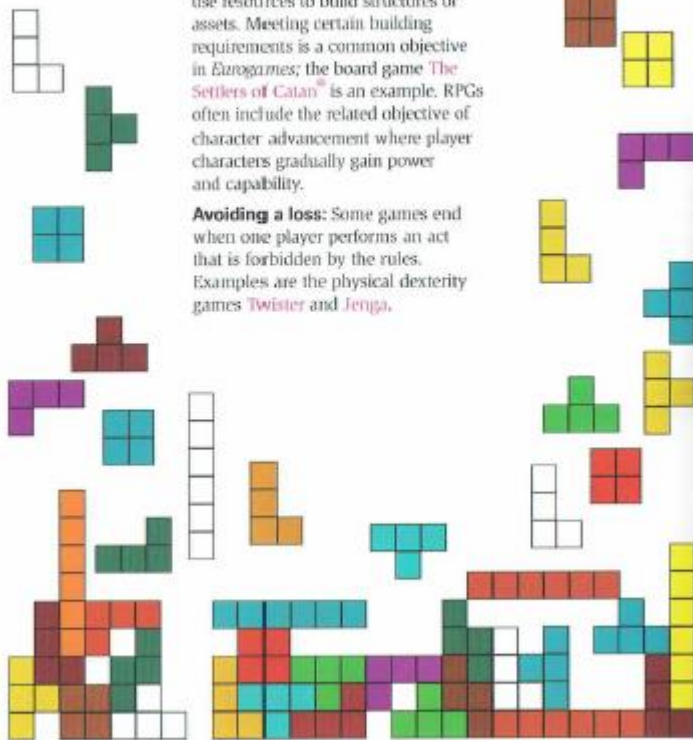


Chase/race/escape: Generally, anything where you are running toward or away from something. The board game *Candy Land* is a race to the finish. The playground game tag is another example.

Spatial alignment: A number of games involve the positioning of elements as an objective, including the nondigital games tic-tac-toe and *Pente*, and the electronic game *Tetris*.

Build: The opposite of “destroy,” players use resources to build structures or assets. Meeting certain building requirements is a common objective in *Eurogames*; the board game *The Settlers of Catan* is an example. RPGs often include the related objective of character advancement where player characters gradually gain power and capability.

Avoiding a loss: Some games end when one player performs an act that is forbidden by the rules. Examples are the physical dexterity games *Twister* and *Jenga*.



Advance the story: Sometimes the objective of a game is just to continue a storyline and see what happens next to the characters. This is especially common in role-playing games of all types.

Explore: Game worlds like the *Legend of Zelda* series encourage players to travel around the world and discover new characters and places.



Rules, Mechanics, and Systems

There are three categories of rules, all important to a successful play experience.

- *Setup* involves things you do once at the beginning of the game.
- *Progression of play* entails what happens during the game.
- *Resolution* indicates the conditions that cause the game to end and how an outcome is determined based on the game state.

Mechanics are collections of rules that combine to form a discrete chunk of gameplay. In a similar way, **systems** are collections of mechanics that make up the biggest chunks of the game. For example, basketball has a system for determining which team has possession of the ball. Mechanics for turning over the ball to the other team are a subset of that system. Lastly, a rule says that a team loses possession of the ball if a member of that team is the last to touch the ball before it goes out of bounds.

These categories help designers to understand how their games work and can be powerful all the way from concepts through final iterations. If tests suggest a problem, the designer must determine whether the problem involves an individual rule, a mechanic, or an entire system.

Many games also have unwritten rules implied by player expectations. For example, many turn-based games do not have a time limit on the turns. Players may be expected to take turns in a "reasonable" amount of time and not stall the game indefinitely. When in doubt, designers should clearly define such rules in order to encourage smooth play.



Resources

Resources are all the things directly under a player's control that can be used as the game advances. This includes explicit resources (pieces in chess; health, mana, and currency in *League of Legends*) and can also include other items under player control:

- Territory in Risk
- Number of questions remaining in twenty questions
- Objects that can be picked up in electronic games (weapons, power-ups)
- Time (either game time or real time or both)
- Turns or opportunities to take action
- Known information (the suspects that you have eliminated in *Clue*)

What kinds of resources do players control? How are these resources manipulated during play? How are the resources limited? The game designer must clearly answer these questions through the game rules.



Resources are also limited or constrained in some way, and these limitations create the tension that makes strategizing and game decisions interesting. Does the player have enough health to survive the attack? Can the player miss the jump and still have enough time to reach the end? Can the player afford to spend \$200 on a property this turn knowing that he will be moving through a dangerous part of the board? Should the player use his turn to improve defenses or attack the opponent?

Games also have resources that are available but not yet under the control of a player. Gameplay can develop around both spending resources and acquiring resources. Systems or mechanics also need to be in place to track resources not yet under player control. For example, in *Monopoly*, players know which resources (properties) are unowned. In most card games, the players know what cards are in a deck, but they do not know the order, and they often do not know what cards have been drawn by other players. In other cases, the available resources are completely unknown.

Theme

Thematic elements—stories, settings, characters, etc.—give games topics. They answer the question “What is the game about?” which is different from the question “What is the *gameplay* about?” Not every game has a theme, and not every game needs a theme. Most playing card games and sports do not have themes. However, a well-chosen theme can have a big impact on the play experience.

Thematic elements have three primary purposes:

1. **Help players become more engaged.** Players personalize the game experience if they identify with their **character** (*I am Pedro the wizard*). Similarly, an interesting **setting** can add emotional weight. A game set in a haunted mansion will cause a response different from one set in the Wild West, even with the same mechanics.
2. **Make a game easier to learn.** The piece movement rules in chess have a limited relation to the theme and must be memorized by players. By contrast, players in a racing game expect mechanics for accelerating, braking, and steering because that is how real vehicles work.
3. **Tell a compelling story.** Games can be used to share interesting stories, just like other media.

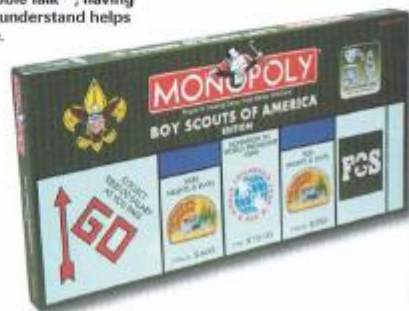




Themes also create player expectations. If your game is set during the American Civil War, airplanes would be out of place. Similarly, players would expect a board game version of basketball to include a three-point shot, just like in the sport. Such expectations can also create unwritten rules for how a player or a designer thinks a game “should be” played. Designers must be sure to write down or program all the rules that they want players to follow so that there is no confusion on how the game is played.



Even for a simple game like Bubble Talk™, having rules that are clear and easy to understand helps make the game more enjoyable.



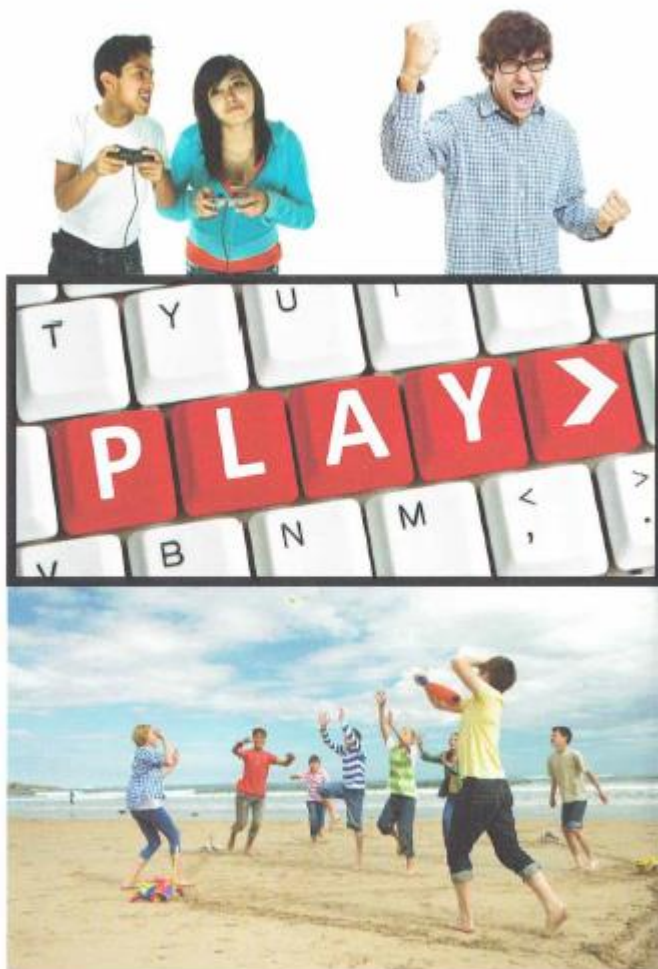
The Boy Scouts of America has its own special edition of *Monopoly*.

The Benefits of a Theme

The best thing that a theme can do is make it easy to learn the rules. If you have a game about building automobiles, and your goal is to build factories, make cars, and hire salespeople to sell those cars, the theme makes it easy for you to remember the goals of the game because the goals are very similar to what would happen in real life if you ran a car company. A game can be without a theme, but themes both add a framework that makes it easier to understand the rules and goals of a game and give players a way to “escape” into the game—to become the head of a car company, or an army general, or a starship pilot. Themes are what catch the imagination of a potential player, for games are in fact interactive stories. At the same time, games are puzzles, so the theme should always lead you to how the game works.

—Alex Yeager, submissions editor, *Mayfair Games*





Why We Play Games

Game elements are building blocks that designers use to make games, but they do not tell the full story. It is equally important for the designer to consider the player's perspective. Why would someone want to play your game? If they are playing "for fun," what does that mean? Every player will have an opinion about what kinds of activities are enjoyable or engaging, and these opinions will reflect the player's personality.

Play value refers to reasons that a player chooses to play a particular game.

Game experiences can be rated on five areas of play value: novelty, challenge, stimulation, harmony, and threat.

The following material is based on Jason VandenBerghe's "Domains of Play" presentation given at the 2012 Game Developers Conference and is used with permission.

Novelty

Novelty describes how much a game provides the player with imaginative, new, or unexpected experiences. Novelty can be introduced through theme (fantasy, art, and storytelling) and mechanics (chance and sandbox modes).

Sandbox mode gives players more freedom, options, and flexibility. For example, it might allow players to ignore certain game objectives, have unlimited access to resources, or enjoy safety from enemies and dangerous obstacles. However, such "opportunities" may result in consequences unforeseen by the game designer. Compare it with how you felt when you were a little boy playing in a sandbox—few rules and lots of flexibility.

Games with a high novelty factor often have a high replay value, meaning they are fun to play more than once.

Have you ever dreamed of being a superhero who can fight crime with a range of powers? What about a medieval king defending your kingdom from invaders? Perhaps you want to search the stars on a spaceship. Games can allow players to take on roles that would otherwise not be possible.

The symbols on a playing card deck are well-known, and other card games often have unique, engaging artwork. Electronic games engage the eyes and ears with large amounts of art, visual effects, music, and sound effects. All of these sensory elements can add depth to a game and make it more engaging to play.

Role-playing games can tell engaging stories. Sometimes the most fun part of a game comes from creating a unique storyline and play sequence, meeting characters, and interacting with them as they overcome tough challenges or go on amazing adventures.

Players who like novelty may gravitate toward games with randomized content or chance-based mechanics as part of the game design. These add unpredictability and uncertainty that can keep a game fresh. Open-ended games, such as *Minecraft*TM, incorporate novelty through their “sandbox” play.



Challenge

Some players enjoy games that provide challenging tasks to be practiced and mastered. Unlike other forms of entertainment, games have a unique ability to provide meaningful “work” where we can make clear progress and are happy to try again if we fail. Difficulty, advancement, and completion are all ways players experience challenge.

Challenge can be introduced through mechanics (player advancement), resources (finding and collecting needed materials), and objectives (discovery of the unknown). A game based on difficulty is like an obstacle course. The fun comes from successfully overcoming the hurdles made by the game designer. To do so, the player must learn or improve particular skills. The game designer must decide whether particular content is difficult enough to be interesting but easy enough to match with what the player has learned from the game.

The quickest way to lose your audience is by creating obstacles that are far too hard, resulting in a reward inadequate for the player's effort, or far too easy. Games can test a player's physical skills, reaction speed, problem-solving ability, and more. Many games, especially those implemented electronically, have a varying degree of difficulty in order to better match the game to the player's personality and skill.

World of Warcraft® is an example of a game with a significant advancement component. As the player's character performs tasks, the player gradually gains access to new or more powerful abilities and stronger armor and weapons. Players can then defeat progressively more powerful monsters. While this is similar to difficulty-based gameplay, the player is not necessarily improving. Instead, the player's character becomes more powerful as the player spends time with the game. Found in most role-playing games, player advancement is increasingly common in other types of games.



An old slogan of *Pokemon*—“Gotta Catch ‘Em All!”—is a good description of completion in gameplay. In these games, the player may be trying to collect all the coins, buy all the property, conquer the entire map, or accomplish all of the possible tasks. The gameplay provides a journey to that final collection, and each step should be satisfying on its own. It is important for the game to communicate to players when they have made progress and how far they need to go to reach the end.

Besides letting people play new roles, games can bring players to uncharted territories, magical places, new worlds. Once there, a natural reaction is to take a look around. Discovery is a big part of text-based role-playing games and many electronic games.



Stimulation

Stimulation deals with the emotional element of play. Self-expression, role, pace, and excitement are all ways in which players experience stimulation. Stimulation can be introduced through player format (team play, player roles), objective (solve, chase, escape), and mechanics (how players take turns and time limitations).

Many party games involve forms of self-expression like acting, singing, and drawing because they are enjoyable for both the person doing the work and the people sharing it. Text-based RPGs also place a heavy emphasis on creativity.

In many team and multiplayer games, a player's role can be key to how a player experiences the game. Think of football—playing as the quarterback is very different from playing as a lineman. In role-playing games, players often choose different roles (fighter, magic user, ranger, etc.) based on what the player experiences as fun.



Pacing and the play sequence also have an impact on fun. Players with a high need for stimulation would most likely enjoy real-time games (most team sports) or games with strict time limitations, while those with a low need for stimulation might prefer turn-based games (most board games) or games that are more open-ended.

A final aspect of stimulation is the thrill of victory and agony of defeat. Many live-action and electronic sports games have gameplay that fulfill a player's need for stimulation.

Harmony

Harmony reflects the rules of player-to-player interaction. Trust, integrity, helpfulness, competitiveness, and compassion are all ways in which players experience harmony. Game elements that can be used to emphasize harmony include player format (cooperation vs. competition) and objective (build vs. destroy).

Cooperation and competition reflect two ends of a spectrum. Individual players often have a preference for where they fall along this spectrum; for them, a game's fun factor is higher the closer it comes to their personal preference.



Whether playing with friends, family, or even rivals, multiplayer games help build and strengthen social ties. Games pull people together for common interests. In some cases, the game drives a social event, but for some games like *Apples to Apples*[®], the game is a backdrop to start conversation. Party games lean heavily toward friendly competition. Going one step further, cooperative games make players work together to complete objectives. Massively multiplayer online games often include lots of cooperative gameplay.

In many games, the objective is to outperform an opponent. Competition motivates people to practice skills and think of different ways to succeed. A good competitive game will allow players to display their skills and ingenuity against players of a similar skill level. In more casual competitive games, an element of chance helps ensure that the same player does not win every time. Examples of these types of games include sports and real-time strategy games.

Note that in many individual sports and games, the competition is often with the players against themselves, where they are seeking to improve their time, score, ranking, etc., rather than focusing only on their opponents.

Fun is not the only reason to play. Other motivations to play are to get exercise, master a skill, and teach someone else how to play.



Games that incorporate a high degree of reflex into their game mechanics appeal to the player's desire for threat.

Threat

Tension, danger, provocation, and humiliation all are ways that players experience threat. Player format (team structure), mechanics (real-time play), objectives (chase, escape, and race), and resources (better weapons, armor, cars, etc.) are the primary game elements used to incorporate threat.

These games are fun because of their heart-pounding action and the enjoyment people get out of crushing their opponents. Paintball, (multiplayer) first-person shooters, and racing games are all examples of games that appeal to a player's threat instinct.

Most games incorporate multiple types of play value. Basketball, for example, involves novelty (playing against a different team, having multiple lineups as players come off the bench), challenge (mastering basic techniques such as shooting, dribbling, and passing), stimulation (a fast pace), and both aspects of harmony (cooperating with your team and competing against the opposing team).



A Lesson From Valve

Making a game fun is extremely difficult because we know precious little about what "fun" actually is. At Valve, the electronic game maker, the philosophy is that, while game designers can partially predict what is fun, they cannot do this entirely. As such, "designing" a game (in the conventional sense) is only one part of the process. The rest involves a core iteration cycle:

1. **Playtest**—Recruit people to play the game, then watch them. Take notes on what seems to work, where people seem engaged, where they seem frustrated, etc. At Valve, sometimes playtesters are people involved in the production of the game and sometimes they are people from outside the company. We try to mix it up because you get different kinds of information from each group.
2. **Evaluate playtest results**—Just because one player did not like something does not mean a game should be scrapped. Look carefully at the playtest results. Decide what to act on, what to watch in the future, and what feedback to discard.
3. **Apply evaluated playtest feedback**—Act on the conclusions from step 2.

We tend to think about this process like a series of experiments. You may even notice that these steps have a lot in common with the classic scientific method. Not only does this give us concrete data about where within a game we are succeeding and failing, it also keeps us focused on *fun* as the primary goal. (That can be surprisingly difficult when you work on a single project for years!)

—Erik Robson, Game Designer, Valve Software

