

# Game and Learn: An Introduction to Educational Gaming

## 10. The Design Perspective

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Starting Out

## The Team

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- Game Designer
- Education:
  - Content Specialist
  - Learning Specialist
- Production Manager
- Visual:
  - Graphic Artist
  - 3D Artist
- Sound:
  - Composer
  - Soundscape Designer
- Narrative:
  - Storyteller
  - Scriptwriter
- Programming:
  - Game Engine
  - Game Implementation
- Play Testers

## The Decisions

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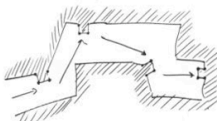
- What is the game about?
- What will be the key elements of gameplay?
- What games in its genre will it resemble?
- What games in its genre will it be different from?
- What other games will it draw upon?
- What elements will be completely new to it?
- What will be the key elements of gameplay, again?
- What is the game's narrative outline?
- What is the game about, again?

# Design Patterns

## Design Patterns (Alexander)


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- The definition of a pattern comprises:
  - Its name;
  - An illustrative picture;
  - An introductory contextual paragraph, explaining how it helps complete other patterns;
  - A summary of the problem;
  - The development of the problem;
  - The solution to the problem, describing the field of physical and social relationships needed to solve it;
  - A diagram to aid in visualizing the solution;
  - A final paragraph linking the pattern to other patterns in the language.
- Alexander's approach is fundamentally oriented towards people taking control of architecture by providing them with a process for developing an awareness of their own pattern languages.

Name	102 FAMILY OF ENTRANCES*	<p>In our work at the Center we have encountered and defined several versions of this pattern. To make the general problem clear, we shall go through these cases and then draw out the general rule.</p> <p>1. In our multi-service center project we called this pattern Overview of Services. We found that people could find their way around and see exactly what the building had to offer, if the various services were laid out in a horseshoe, directly visible from the threshold of the building. See <i>A Pattern Language Which Generates Multi-Service Centers</i>, pp. 123–26.</p>  <p>Overview of services.</p>	Development
Illustration			
Introduction	<p>... this pattern is an embellishment of CIRCULATION REALMS (98). CIRCULATION REALMS portrayed a series of realms, in a large building or a building complex, with a major entrance or gateway into each realm and a collection of minor doorways, gates, and openings off each realm. This pattern applies to the relationship between these "minor" entrances.</p>	<p>Lay out the entrances to form a family. This means:</p> <ol style="list-style-type: none"> <li>1. They form a group, are visible together, and each is visible from all the others.</li> <li>2. They are all broadly similar, for instance all porches, or all gates in a wall, or all marked by a similar kind of doorway.</li> </ol>	Solution
Problem Summary	<p>When a person arrives in a complex of offices or services or workshops, or in a group of related houses, there is a good chance he will experience confusion unless the whole collection is laid out before him, so that he can see the entrance of the place where he is going.</p>	<p>family of entrances</p> 	Diagram
		<p>In detail, make the entrances bold and easy to see—MAIN ENTRANCE (110); when they lead into private domains, houses and the like, make a transition in between the public street and the inside—ENTRANCE TRANSITION (112); and shape the entrance itself as a room, which straddles the wall, and is thus both inside and outside as a projecting volume, covered and protected from the rain and sun—ENTRANCE ROOM (130). If it is an entrance from an indoor street into a public office, make reception part of the entrance room—RECEPTION WELCOMES YOU (149). . . .</p>	Connections

## The Game Design Pattern Template (Björk & Holopainen)

- Name
- Description
  - Core Definition
  - General Description
  - Examples
- Using the Pattern
- Consequences
- Relations
  - Instantiates/Instantiated by
  - Modulates/Modulated by
  - Potentially Conflicting Patterns
- References


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- Gameplay Design Patterns
- Games
  - Age of Empires
  - Alias
  - America's Army
  - Anarchy Online
  - Angband
  - Arcadia
  - Asteroids
  - Backgammon
  - Basketball
  - Battlefield 1942
  - Battlefield -series
  - Battlefield Vietnam
  - Bejeweled
  - Black & White
  - Blackjack
  - Bohnanza
  - Bomber Man
  - Bowling
  - Bridge
  - Can You See Me Now?
  - Carcassonne
  - Carolus Magnus
  - Castle Wolfenstein
  - Checkers
  - Chess
  - Citadels
  - Combat Mission
  - Command & Conquer
  - Counterstrike
  - Counter-Strike
  - Creatures
  - CRobots
  - Dance Dance Revolution
  - Dark Age of Camelot
  - Day of the Tentacle

## Pac-Man

More info: <http://en.wikipedia.org/wiki/Pac-Man>

### Examples

**Collecting:**  
The main actions performed in [Pac-Man](#) is moving and collecting pills.

**Collection:**  
[Pac-Man](#) has to gobble up all the pills to finish a level. While eating each pill is a very low-level goal, the goal for each level is the [Collection](#) of all pills.

**Consumers:**  
in [Pac-Man](#) the pills are consumed by [Pac-Man](#) and ghosts can consume [Pac-Man](#) when he is not under the effect of the power-pill.


**Evade:**  
[Pac-Man](#) has the goal of avoiding the ghosts while collecting the yellow dots.

**Hierarchy of Goals:**  
The rough goal hierarchy in [Pac-Man](#) is as follows: eat the pills while avoiding the ghosts, get the power pill while avoiding the ghosts, chase the ghosts or eat the pills while under the influence of the power-pill, finish levels by taking all pills on each level, and finally get into the high score list.

**Inaccessible Areas:**  
The ghost generator in the middle of the [Pac-Man](#) level is an example of an area the player controlling Pac-Man cannot enter.

**Power-Ups:**  
The power pill in [Pac-Man](#) allows Pac-Man to hunt ghosts for a limited amount of time.

**Producer-Consumer:**  
In [Asteroids](#), the rocks are produced at the start of each level and are consumed by the player shooting at them. The same principle applies to many other games where the level progression is based on eliminating, i. e., consuming, other game elements: the pills in


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- Gameplay Design Patterns
- 5. Game Design Patterns for Game Elements
  - 6. Game Design Patterns for Resource and Resource Management
  - 7. Game Design Patterns for Information, Communication, and Presentation
  - 8. Actions and Events Patterns
    - Ability Losses
    - Aim & Shoot
    - Area Control
    - Asymmetric Abilities
    - Attention Swapping
    - Betting
    - Budgeted Action Points
    - Camping
    - Collecting**
    - Combat
    - Construction
    - Damage
    - Decreased Abilities
    - Disruption of Focused Attention
    - Downtime
    - Experimenting
    - Extended Actions
    - Focus Lock
    - Game World Navigation
    - Illusionary Rewards
    - Improved Abilities
    - Indirect Control
    - Interruptible Actions
    - Irreversible Actions
    - Leaps of Faith
    - Limited Set of Actions
    - Maneuvering
    - Movement

## Collecting

*The action of collecting game elements from the game world.*

[Collecting](#) is one of the most common activities in games. The collecting may be concrete by moving game elements around the game world and picking up game elements found or may be abstract by receiving game elements directly through actions or completing goals.

### Examples

The game play is [Super Mario 64](#) and [Super Mario Sunshine](#) is based around the collections of stars which unlock new levels and drive the story forward.

The main actions performed in [Pac-Man](#) is moving and collecting pills.

[Comments \(0\)](#)

### Relations

**Instantiated by**

- [Score](#)
- [Pick-Ups](#)
- [Power-Ups](#)
- [Tools](#)
- [Transfer of Control](#)
- [Rewards](#)
- [Resources](#)

**Instantiates**

- [Hierarchy of Goals](#)
- [Movement](#)
- [Collection](#)
- [Player Defined Goals](#)
- [Maneuvering](#)

**Modulated by**

- [Geometric Rewards for Investments](#)
- [Herd](#)

**Modulates**

- [Character Development](#)

## The Process

## The Game Design Process

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- Frame your existing material in terms of similar games and their design patterns
- Develop your narrative structure
  - Include all key plot, character, event items
- Develop your game world structure
  - Use design patterns for both inspiration and control
  - Keep matching it back to the narrative structure
- Match both narrative and game world to your educational goals

## Design Worksheets (Rollings & Adams)

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### Gameplay Worksheet

1. What types of challenges do you want to include in your game? Do you want to challenge the player's physical abilities, his mental abilities, or both?
2. Game genres are defined in part by the nature of the challenges they offer. Have you selected a genre in advance, and if so, what does that imply for the gameplay? Do you intend to include any cross-genre elements, challenges that are not normally found in your chosen genre?
3. Does the game include implicit challenges (those that emerge from the design), as well as explicit challenges (those that you specify)?
4. If the game has a story, how does the story influence the gameplay, and vice versa? Do they operate in tandem, or are they effectively separate pieces?
5. If the player has an avatar, how does the gameplay influence the avatar's appearance and capabilities?
6. Is the game's collection of challenges a related group, or is it a compilation of unrelated elements? If the latter, does that have any effect on the player's suspension of disbelief?
7. Given that not all players enjoy the same kinds of challenges, how does the game's target audience influence the challenges it includes? What challenges will you deliberately exclude?
8. Will the player be required to face more than one challenge at a time? Which ones?

## The Game Design Documents (Rollings & Adams)

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- The High-Concept Statement
  - Used to “sell” the game, communicate quickly about it
- The Design Script
  - Used for actual game development, team coordination
  - Crucial as a way of keeping development clear, coordinated, and on track

## The High-Concept Statement

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- The central idea of the game
- Genre
- Key features
  - Include both game world and narrative structure aspects
  - Diagrams, sketches, screenshots are important here
- Design goals
- Target audience/player motivation
- Unique features

## The Design Script

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- Incorporates all the material from the High-Concept Statement, plus:
  - Complete narrative script
    - Include all atomic information, i.e., characters, story arcs, events, etc.
  - Complete gameworld specification
    - Relate items to design patterns
    - Make all narrative interaction clear
  - Design sketches and screenshots
  - Timelines for development
- As development progresses, this document will need to be updated



## Resources Cited

- **Design Patterns:**

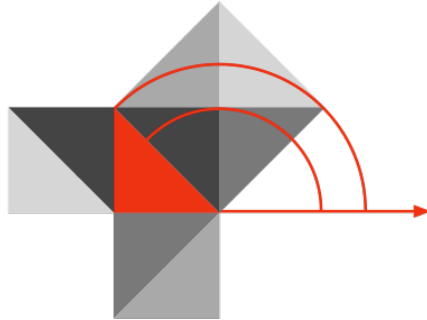
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<http://www.gameplaydesignpatterns.org/>

- **The Process:**

- Rollings, A. and E. Adams. *Andrew Rollings and Ernest Adams on Game Design*. New Riders Publishing. (2003)  
or:
- Adams, E. and A. Rollings. *Fundamentals of Game Design*. Prentice Hall. (2006) Online materials at:  
[http://wps.prenhall.com/bp\\_gamedev\\_1/](http://wps.prenhall.com/bp_gamedev_1/)

# Hippasus

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