

## Introduction

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This document describes a variety of game design principles in terms of its pros and cons, how one would use this principle in a game, and the significance of this principle as it pertains to games.

## Risk and Reward

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When given actionable options within a game, the concept of risk and reward presents choices the player must weigh in each situation they encounter. Some options reward better; however, this usually comes at the risk of a higher punishment. Fighting games often need to balance these options like Super Smash Bros. Ultimate for example. A character like Pyra and Mythra has several options that vary in risk and reward; Mythra has very little start up on many of her moves while Pyra is often slower but hits harder. Choosing to go for a dash attack or forward smash with Pyra could be the difference in winning or losing a match.

Balancing risk and reward systems with high risk, high reward and low risk, low reward options thus has the advantage of forcing the player to think about the best option to use in a specific scenario. However, achieving this system is difficult to achieve, which is why a disadvantage to risk and reward is having one option always take center stage.

## World Keys and Gating Mechanisms

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In games that require the player to navigate a world, the principle of world keys acts as a barrier to entry into intentionally gated regions. The idea of this principle is to prevent player progression until certain powers, abilities, or skills are obtained to “unlock” the gate. Metroidvanias are most notable in implementing this. In Hollow Knight, access to some regions is locked until the player obtains the mothwing cloak (*dash*), mantis claw (*wall jump*), monarch wings (*double jump*), crystal heart (*super dash*), and other skills.

The advantage of using these gating mechanisms is that you can ensure players have access to the ability gating that section without having to hard-code a mechanic that stops the player from entering. In addition, this principle encourages players to search for the tools they need to reach areas since it's not explicitly said what will help them get through. A disadvantage to this, however, is that in large world environments, players may end up forgetting about or skipping areas they've passed before.

## Resource Management

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Enforcing limitations on supplies or abilities players can use describes the idea of resource management. Players need to be aware of materials or energy they expend with certain

choices. In a farming simulator like Stardew Valley, the simple action of watering crops uses energy; players need to manage their use of energy wisely as other actions like cutting wood, mining rocks, or plowing land also consume energy.

Resource management has the advantage of slowing game progression since the idea of a limit often expands into the idea of level progression where players can obtain enhancements that increase this limit. For disadvantages, this principle makes the beginning of a game feel more restrictive than the end, which is only natural. Players most certainly will feel a gap in what they are able to do late game in comparison to early or even mid game.

## Summary

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Each of these game design principles has its own pros and cons. Risk and reward is one I think I'll need to implement for my idea; for example, in my reverse tower defense idea, choosing to spawn a stronger but more expensive unit over a weaker but cheaper unit. World keys may not be relevant for my own idea, but for a future idea, a gating mechanism in terms of the strength of a player's ability could be interesting. Finally, resource management will most likely be used in my game. In terms of implementation, a "morale" system that refills over time with a cap would facilitate resource management.

## Sources

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- [1] [https://gamestudies.org/1101/articles/williams\\_nesbitt\\_eidels\\_elliott](https://gamestudies.org/1101/articles/williams_nesbitt_eidels_elliott)
- [2] <https://youtu.be/7ITtPPE-pXE?si=VFVHzDdl8cnMR436>
- [3] <https://gamedesigns.github.io/docs/book/chapter-01#resource-management-fundamentals>

## AI Usage

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N/A