

# **Fundamentals of Game Mechanics**

CS-330: Introduction to Game Programming

# What are Game Mechanics?

“Game mechanics are the rules and procedures that guide players through the game.”

Source: <https://www.universityxp.com/blog/2020/2/6/game-mechanics>

# Types of Game Mechanics

Game Mechanics include:

- “**Action Mechanics**”: defines the types of movement a player can invoke with their character such as crouching, crawling, climbing, jumping, walking, running.
- “**Strategy Mechanics**”: defines the types of skills the player must devise in order to complete the game objectives, quests, or advance to the next level of the game (e.g. solving a riddle or recovering hidden treasure)
- “**Exploration Mechanics**”: defines rules, objectives, and strategies necessary for players to discover hidden secrets or areas within the game.
- “**Resource Management Mechanics**”: defines the rules, objectives, and strategies players must follow to procure and manage expendable assets such as food/drink, gold coins, or ammunition.
- “**Role-Playing Mechanics**”: defines the rules and options for how and when players may strategically increase various physical attributes of their character (e.g. strength or health) or skills (e.g. spellcasting or lockpicking) as the player progresses through the game.

Source: <https://www.juegostudio.com/blog/the-ultimate-beginners-guide-to-game-mechanics>

# Types of Game Mechanics

Additional Game Mechanics include:

- **“Progression Mechanics”**: Techniques for increasing player engagement through a sense of accomplishment as gameplay continues. Common methods include:
  - “Experience Points (XP)”
  - “Leveling up”
  - “Unlockable content”
  - “Collectible content”
  - “Leaderboards and achievements”
  - “Skill trees”
  - “Quests and objectives”
  - “Progress bars”
  - “Character customization”
- **“Social Mechanics”**: Techniques for promoting cooperation, competition, and interaction as well as a sense of community and shared-experience among the players in a multiplayer game.

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Differentiating Game Mechanics and Fluff

- “A good game mechanic is one that interacts with a wide variety of different situations and shapes the way players approach the game.”
- “On the other hand, fluff is an element of the game that has no meaningful effect on gameplay.”

## **EXAMPLE:**

Fluff: Staring down the scope of a gun does not in any way impact the outcome of a game.

Game mechanics: Staring down the scope of a gun impacts the player’s accuracy in hitting the target.

Source: <https://www.occasoftware.com/blog/intro-to-game-mechanics>

# Why develop Game Mechanics?

Game Mechanics impacts game design in the following ways:

- **“Flow”**: The level of engagement as the player transitions through various challenges in the game.
- **“Motivation”**: Describes incentives for increasing player retention and engagement such as rewards (e.g. experience points, increased health, increased strength, or spellcasting capability) for solving quests.
- **“Improved User Experience”**: Like motivation (above) describes techniques for increasing player retention and engagement during game-play such as posting player accomplishments on a leaderboard.
- **“Player Progression”**: Techniques for increasing player retention and engagement as a player progresses through a game to alleviate player boredom. Example: unlocking new, previously unseen game levels with new game content.
- **“Player Agency”**: Techniques for increasing player engagement by making players stakeholders in the fate of their character through a series of choices and decisions as the game progresses.
- **“Open-Ended Exploration”**: Allows the player to traverse a game in a natural, non-predetermined manner and allow for serendipitous discovery.
- **“Emergent Gameplay”**: Techniques for increasing player engagement that, like Player Agency, allow the player to make choices which influence the outcome of the game as gameplay progresses.

Source: <https://www.juegostudio.com/blog/the-ultimate-beginners-guide-to-game-mechanics>

# Game Mechanics of two popular games

*Note: The following two games had vastly different game mechanics and yet both were popular hit games:*

- **Super Mario Bros.:** “...running, jumping, navigating obstacles, collecting power-ups, and progressing through levels.”
- **Grand Theft Auto V:** “...free-roaming in an open world, engaging in story missions and heists, vehicle combat, melee combat, character progression, and sophisticated AI behavior.”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Game Mechanics best practices?

Instead of seeking “best practices in Game Mechanics”, let’s **INVERT** that statement to:  
*Worst practices in Game Mechanics* (or Game Mechanics to avoid).



# Worst practices in Game Mechanics

- “Unbalanced Difficulty”
- “Unrewarding Gameplay”
- “Neglecting Play Testing”
- “Poor Feedback Systems”
- “Overcomplication”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Worst practices in Game Mechanics

## **“Unbalanced Difficulty”:**

- “Little to no enemy / protagonist scaling concerning the player progression”
- “Player power creep”
- “Sudden spikes in difficulty after easier sections”
- “Insufficient feedback on player actions or outcomes”
- “Enemies or NPCs [Non-Playing Characters] with inconsistent behaviors”
- “Inadequate balance of power-ups or abilities”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Worst practices in Game Mechanics

## **“Unrewarding Gameplay”:**

- “Lack of meaningful milestones”
- “Repetitive or mundane tasks”
- “Poor implementation of the player progression system”
- “Unbalanced rewards implementation”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Worst practices in Game Mechanics

## “Neglecting Play Testing”:

- “Failing to test all aspects of gameplay mechanics”
- “Disregarding or undervaluing player feedback”
- “Conducting playtests with a narrow demographic or skill level”
- “Conducting playtests without clear objectives”
- “Not incorporating external playtesters or conducting open beta tests”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Worst practices in Game Mechanics

## **“Poor Feedback Systems”:**

- “Slow or delayed responses to the player’s actions”
- “Unclear feedback cues”
- “Providing too much or too little information”
- “Responses that do not reward players appropriately”
- “Tutorials with unclear or immediate feedback”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Worst practices in Game Mechanics

## “Overcomplication”:

- “Including too many mechanics”
- “Lengthy or overly detailed tutorials”
- “Poorly integrated new mechanics”

Source: <https://300mind.studio/blog/game-mechanics-guide/>

# Worst practices in Game Mechanics (more)

## “Unskippable Cutscenes”:

- The cutscene is a predefined movie section to fill-in a backstory or provide continuity before the player can continue gameplay. If the player can't skip the cutscene, the player may find it cumbersome and boring to listen to; Engagement is lost.

Source: <https://www.gamedesigning.org/learn/basic-game-mechanics/>

# Worst practices in Game Mechanics (more)

## **“Quick Time Events, or QTEs”:**

These sorts of events force the player to make a quick-decision when a pop-up menu appears on the screen. If the player fails to make a decision fast enough, the player’s character is penalized (e.g. damage or death).

Source: <https://www.gamedesigning.org/learn/basic-game-mechanics/>



# Worst practices in Game Mechanics (more)

## “Escorts”:

Games with missions that *require* the player’s character be escorted by an NPC (non-player character) that is slower than the player’s character and/or vulnerable to damage from enemies.

Source: <https://www.gamedesigning.org/learn/basic-game-mechanics/>

# Worst practices in Game Mechanics (more)

## **“Stealth” (forced):**

Games that force the player’s character into a stealth mode or lose the mission.

Source: <https://www.gamedesigning.org/learn/basic-game-mechanics/>

# Worst practices in Game Mechanics (more)

## **“Morality Choices”:**

Games that force the player’s character to make moral choices when the outcome of such choices has minimal impact on the gameplay except the game-end.

Source: <https://www.gamedesigning.org/learn/basic-game-mechanics/>

# Level-up your knowledge

*Game Mechanic Alignment Theory* by Michael Cerny Green, Ahmed Khalifa, Philip Bontrager, Rodrigo Canaan, and Julian Togelius. Available at: <https://arxiv.org/pdf/2102.10247>