

# What is RNG?

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Have you ever been overwhelmed by the number of acronyms in the gaming world? From genres to technical jargon, there's a lot to keep track of. For example, RNG for example.

In this article, **TipsMake.com** will explain what RNG is in the video game context. The article will examine the meaning of RNG, study some examples and see how it can even be applied to speedrunning (breaking a game).

## Learn about RNG - The lesson that gamers can not ignore

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## What is RNG?



RNG stands for Random Number Generator. This is defined as a device or algorithm that comes with random opportunities. In gaming terms, RNG refers to events that are not the same every time you play.

Although it sounds simple, computers actually have trouble generating random numbers. This is because computers are designed to follow instructions, as opposed to random. You can't tell a machine: 'Give a random number', because giving instructions to choose something at random seems a bit contradictory.

## **True RNG (TRNG) and Pseudo-RNG (PRNG)**

Therefore, to actually generate a random number using a computer, you must use a physical device called a hardware random number generator. The tool uses microscopic physical processes such as electronic noise, to generate random numbers.

There is no way a person can predict or know what happens to events like this, so they are as random as possible. This type of RNG is important in security-focused systems and therefore appears in popular forms of encryption. If someone can figure out how the system issues random numbers for an encryption protocol, that would be a big deal.

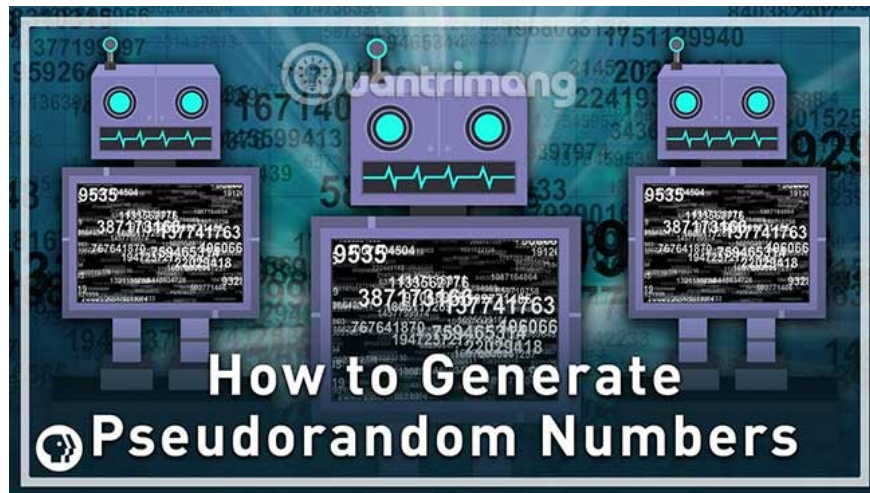
However, this is not a concern for RNG in gaming. For faster speed and easier reproduction, many programs, including games, use what is known as pseudorandom number generation.

Pseudo-RNG uses an algorithm (consider it like a formula) to perform operations on the seed value (initialization) to give a random number. To achieve different outputs each time, it is important to use a random seed as possible.

A simple example would take the current number of milliseconds as a seed, then perform some operations on it, like this:

```
int rand = (a * milliseconds + b) % c
```

This is not really random, because using the same seed will produce the same result every time. But it is good enough for video games.



## Example of RNG in gaming

Now that you know the techniques of RNG, let's take a look at some examples of RNG in games to see how it plays a role.

### Loot RNG

RNG plays a big role in loot-focused games like Destiny, Borderlands and Diablo. When you open a treasure chest or defeat an enemy, the rewards generated are not the same in all cases. The game determines random rewards each time, so you can get lucky and receive an instant super rare item, or a low-level repetitive armor set.

Of course, to keep the game balanced, the loot drop (determining the reward) is not entirely random. The game has systems to prevent you from obtaining the best weapon in the game from the first treasure chest you open. Each game has a different treatment, perhaps by limiting the equipment received based on your player level.

Getting better booty is one of the reasons video games are so 'addictive'.

### Determine the percentage of opportunity with RNG



Many games use RNG to find out what percentage of an event occurred. This is often seen in role-playing games (RPGs).

For example, when you attack in role-playing games like Persona 5 or Chrono Trigger, you can trigger a fatal blow that does additional damage. This happens randomly, although in many games you can increase your chances by using certain items. In Pokémon games, RNG determines the frequency of battles with wild Pokémon and which creatures you encounter.

Similar examples of this appear in games like Super Smash Bros. Mr. Character Game & Watch has a move called Judge, which displays a number between 1 and 9 when used. The value is determined by RNG every time you use it, except that you cannot get the same number twice in a row.

## Perform procedural generation via RNG

RNG is the center of procedural generation, a common trend in gaming. Procedural generation refers to the process of creating game content through algorithms instead of crafting everything manually.

Popular games built around procedural generation include Minecraft and Spelunky. These games create a unique world through a seed value, meaning each player will have a different experience every time they play the game.

Like other RNG forms, game developers add restrictions so that many worlds are randomly generated. For example, you won't find random floating blocks on an ocean in Minecraft.

## RNG in speedrunning

Chances are you've heard about RNG video games in the context of speedrunning. Because speedrunners aim to finish a game as quickly as possible, they practice a lot to learn about the game from the inside out. Therefore, RNG adds an unpredictable element to speedrun gaming.

Although often causing problems, RNG does not always have a negative meaning in speedrun. There are some differences between games that can make the game more appealing because it makes it easy to improve time with a little luck.

## RNG speedrun small to medium

Sometimes, RNG is hardly important for every play. The exact position where the enemy appears in a room, or whether you are critically struck in a regular battle, does not greatly affect your total time.

In other cases, RNG may cause a significant slowdown. For example, in Super Mario Sunshine, a match with King Boo involves shooting a slot machine with 5 possible outcomes. To defeat King Boo, you must first pair the three pineapple symbols to create more fruits.



Then you have to throw a chili at King Boo to burn its tongue, followed by hitting it with any other fruit. With good RNG, peppers will appear in a convenient location so you can quickly finish the fight. However, if you are unlucky, you may have to spin the roulette many times.

## RNG "breaks the game"

Some games with unfortunate parts with RNG can completely ruin the game. An example of this happens with Banjo-Kazooie.

Near the end of the game, you join a quiz program called **Gruntly's Furnace Fun**, which tests you with questions about your adventures. Possible questions about Gruntilda, the villain in the game. If you talk to Gruntilda's older sister Brentilda during the game, she will give you answers to these questions.

However, the correct answers to these questions are random at each play. Speedrunner doesn't want to waste time talking to Brentilda, so they have to guess the answer at this point. This completely depends on luck. If they choose the wrong answer too many times, they can 'die' and take a lot of time.

There is a part of relying on this RNG at the end of the game that annoys speedrun, because the player cannot do anything other than hope he is lucky. However, speedrunners often find a way to overcome these barriers, as the video below shows:

# Applying RNG

As the article discussed, pseudo-RNG of video games is not really random, because you can reproduce the result if you use the same seed. Many games use an internal timer as a seed, which can be a bit tricky to exploit. But other games are much easier to play.

Golden Sun, an RPG on Game Boy Advance, is a great example of this. The game determines the reward you receive for completing a battle based on the actions you performed during the encounter. This means that if you fight a battle against the same enemy using the same tactic, you will receive the same item each time.



Speedrunner can use the simulation tools to analyze a game and find out if they can manipulate its RNG. They can then take advantage by ensuring desired results or minimizing potential waste of time from RNG. But for normal players who don't understand the seed, this type of RNG is random enough.

The article looked at what RNG is, examples of how RNG affects games and how to apply it to speedrun. Now perhaps you have a better understanding of RNG's role in gaming.

You can refer to some articles of TipsMake.com such as:

1. Tips to play Rules Of Survival to stand TOP
2. Some simple Apex Legends tips to help you win TOP 1
3. Some tips on playing Late Game Auto Chess Mobile

Good luck!

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