

A Study on Endfield's Gacha Against Other Gachas

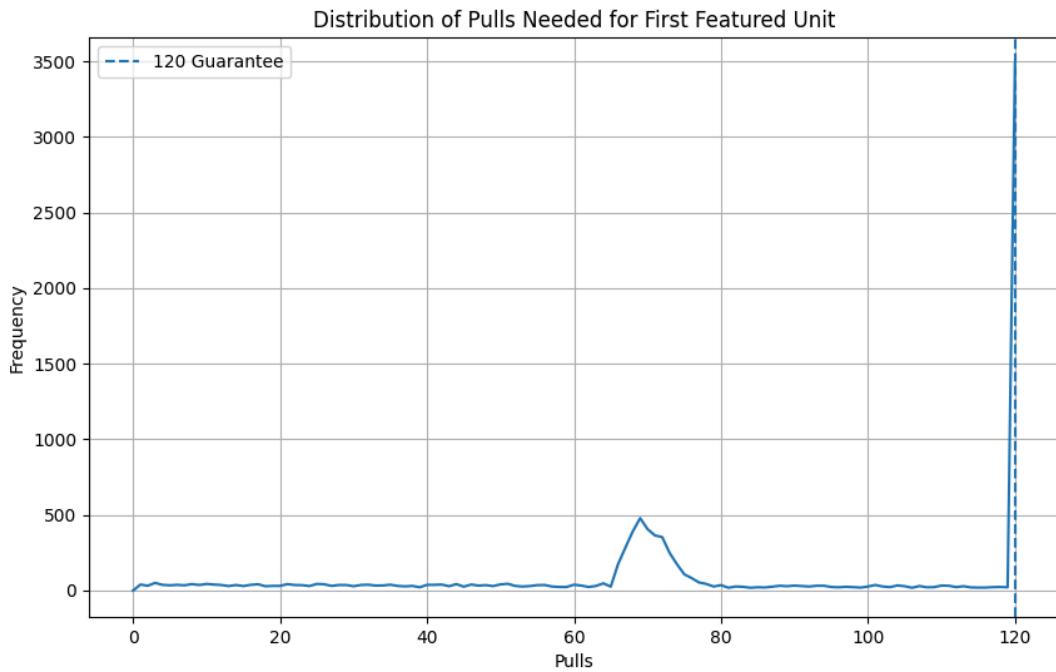
Hello! This document compiles the findings of how free-to-play and pay-to-play players would pull and spend in the game. Below is the GitHub repository containing the codes used to run the experiments. In case of minor errors, the document logs the fixes and the dates at the very bottom of it.

GitHub Repository: <https://github.com/kukkiforarknights/gacha-experiments>

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Endfield's Free-to-play Character Gacha



The graph substantiates that a free-to-play player should only consider pulling on a banner when they have more than 120 pulls in their stash.

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Average pulls for FIRST rate-up: 81.97
Median pulls for FIRST rate-up: 74
Arsenal tickets for median FIRST rate-up: 5616.914285714286
Number of weapon rolls possible at median: 28.37
Number of experiments hitting 120-pull guarantee: 3485
Average arsenal tickets when hitting 120-pull guarantee: 7984.38
Number of weapon rolls possible at average (120 guarantee): 40.33
Number of experiments using at most 80 pulls to get at least one rate-up: 5509
```

For every 10000 people, about 3400 will hit the 120 pity, which makes it a $\frac{1}{3}$ chance that you need that many pulls. Then, about 5500 will use 80 pulls or under to get the first rate up, a 55% chance. If you do not have at least 120 coming into the banner, you will weigh on that 55% chance to get the featured unit with less pulls. Possible, but not recommended as a wise decision.

Average pulls to get a rate-up unit is 80. You are expected to get between 25 to 30 weapon rolls at this amount.

At 120, you expected to get 40 weapon rolls.

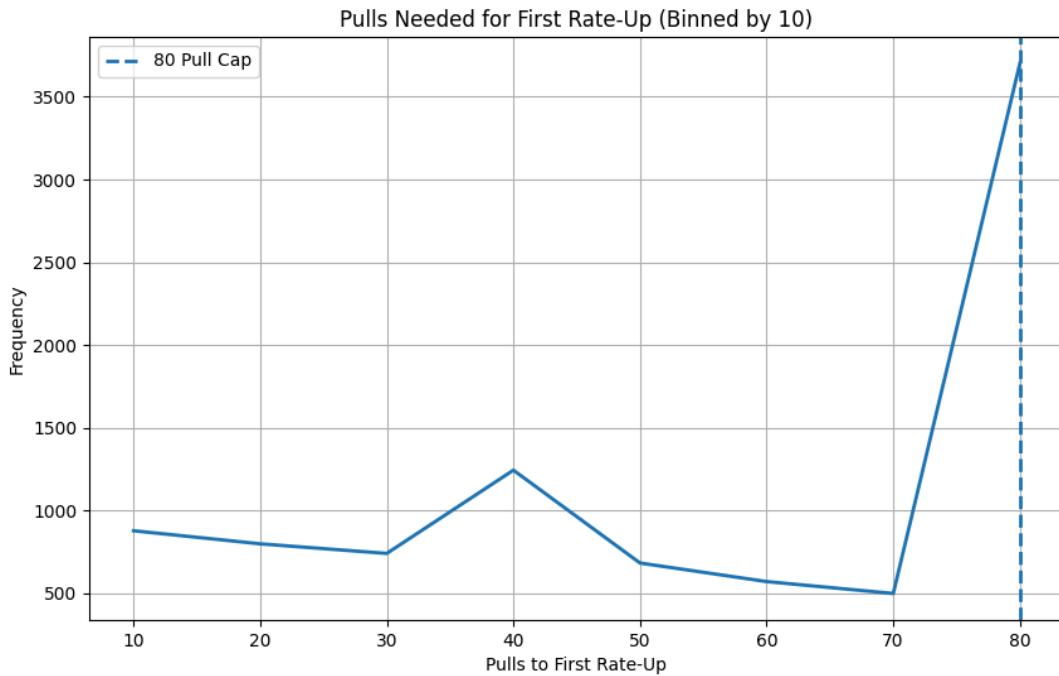
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Off-banner statistics before first rate-up:  
First rate-up on first 6★: 4898  
1 off-banner before first rate-up: 3704  
2 off-banners before first rate-up: 1196  
3 or more off-banners before first rate-up: 202
```

There is a 2% chance you actually fail 3 50/50's. It's quite rare that you will hit this.

There is a 10% chance you fail 2 50/50's.

And, there is a 35% chance you fail 1.

Endfield's Free-to-play Weapon Gacha



Similar to the character banner, it is advisable for you to pull for a weapon only when you have at least 80 pulls.

Average pulls for FIRST rate-up: 52.28
Number of experiments where first rate-up hit 71-80 pulls: 4153
Number of experiments where first rate-up hit 50 pulls or less: 4620

On average, it takes 50 pulls to get the on-rate weapon. 40% of people are expected to use the 80-guarantee. 45% would take 50 or less.

An interesting thing to note is that despite the weapon having 25 on-banner / 75 off-banner, it is a 1% chance to get the on-banner weapon, which is the same as Arknights 6 star on-banner chance. The statistics here quite mimics that experience.

To hit 80 weapon pulls,

- 1: The pull economy must be good at supplying more arsenal tickets so that players do not just get it from character banner pulling.
- 2: Players must remember that weapon banners last for 3 character banners worth, instead of just 1. There is sufficient time to clock up one signature weapon.

This means that a free-to-play player in a time span of 3 banners, can easily get one signature weapon, possibly two, but should not expect three (unless lucky).

F2P Endfield vs F2P Other Games

CHARACTER BANNER

10000 experiments	Arknights: Endfield	Arknights (standard banner)	Hoyoverse	Wuthering Waves
Average pulls to first rate-up	81.97	65.06	94.00	79.48
5th percentile	13	6	18	13
95th percentile	120 (it's capped)	164	158	139

Arknights: Endfield's gacha is similar to Wuthering Waves due to the similar drop rates. Hoyoverse has it as the most expensive for a free-to-play based on numbers of pulls alone. While Endfield may need more pulls than Arknights, appearing worse, it has a better protection system in terms of the maximum cap compared to Arknights and also Wuthering Waves.

However, the comparison of a gacha game being better than another hinges on the pull economy. When assuming equivalent pull economy, meaning per fixed duration there's the same amount of free pulls, Endfield sits to be a better gacha than even Arknights (unless you hate weapon banner). If Endfield is more generous than the competition, the gacha aspect is even nicer for a free-to-play. If it is stingier, then it starts matching the competition and can be worse.

WEAPON BANNER

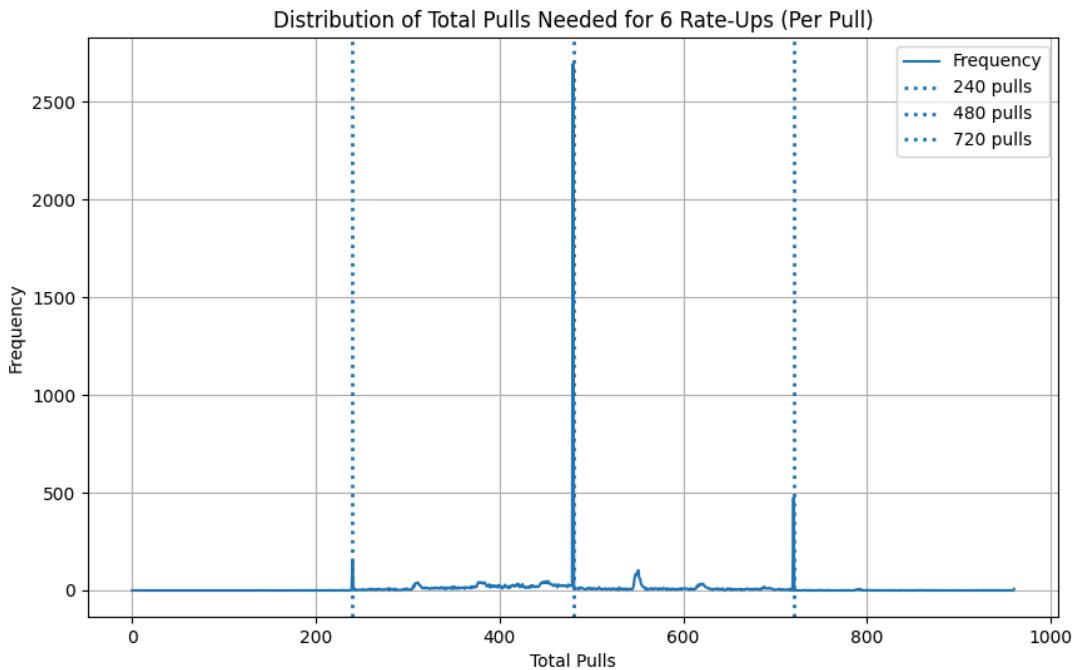
10000 experiments	Arknights: Endfield	Genshin Impact	Honkai: Star Rail	Wuthering Waves
Average pulls to first rate-up	52.81 (rounds up to 60)	88.79	70.61	52.79
5th percentile	10	19	12	7
95th percentile	80 (it's capped)	140	138	72

Endfield numbers are rounded to 10. In truth it should match with Wuthering Waves or even be better (due to 1% on-banner vs 0.8% on-banner). However, they both just behave the same. The Hoyo titles can be a lot more costly.

Also, consider that Endfield uses a separate currency for weapons, Wuthering Waves half-does that, while the other two titles share the same pull currency as the character banner.

Additionally, the other games' weapon banners would only last for one banner duration, Endfield has chosen a three-banner duration approach.

Endfield's Pay-to-play Character Gacha



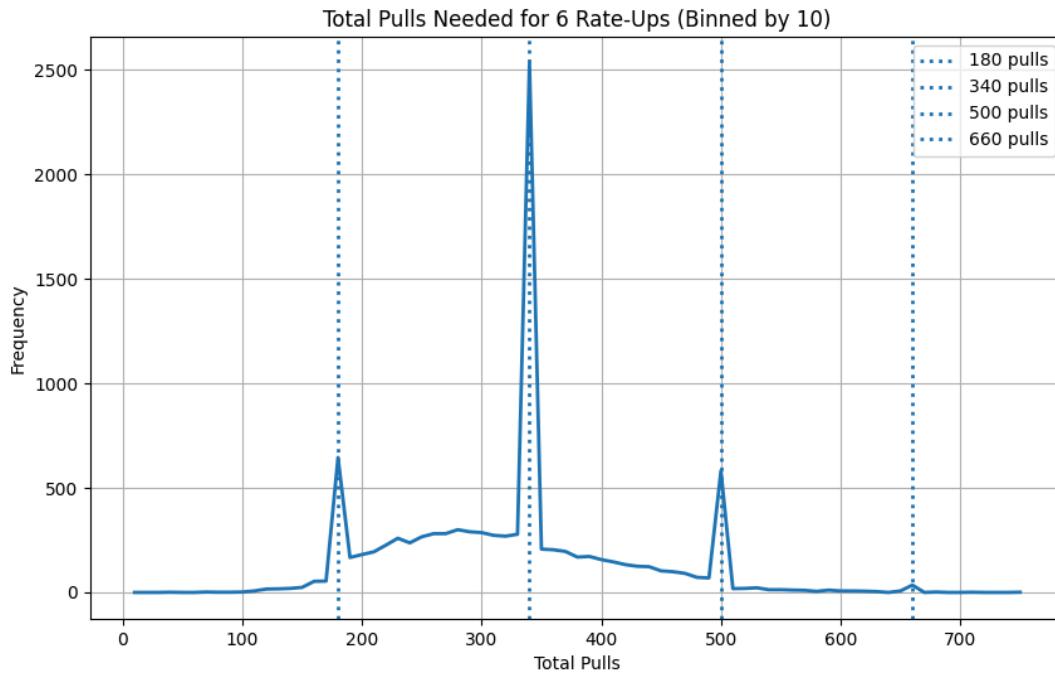
In most instances, a pay-to-play player will on average and usually take 480 pulls to get the on-banner unit. This would mean that they have used the first within 120 guarantee, followed by first potential token given away at 240 and then second potential token given at 480. If unlucky, they may sink deeper from 480 up till 720 where there is a third potential token given, but that would mean failing a lot of 50-50's along the way.

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Best Luck Scenario (minimum pulls): 137
Worst Luck Scenario (maximum pulls): 960
Average pulls needed for 6 rate-ups: 482.24
Median pulls for 6 rate-ups: 480.0
5th percentile pulls: 307
95th percentile pulls: 720
Arsenal tickets at median pulls for 6 rate-ups: 36873.34571110286
Number of weapon rolls possible at median: 186.23
```

Best luck and worst luck are extreme anomalies. Imagine winning Pot 6 in 137 or having to spend 960 pulls, urgh, special kind of luck.

Average needed pulls to max pot a character is 480. The range of pulls it may take is from 300 to 720. Potential tokens will not count to arsenal tickets, hence you would miss the opportunity for 4000 arsenal tickets at median pulls. At 480 pulls, you would attain 180 weapon rolls.

Endfield's P2P Weapon Gacha



The average pulls required is 340, where you received the first guarantee protection, another rate-up at 180 and one more at 340. Meaning, you'll have to win the 1% chance at the on-banner 6* (or the 25 / 75 of the 4%, whichever you see it) three more times.

Arsenal tickets at median pulls for 6 rate-ups: 36873.34571110286
Number of weapon rolls possible at median: 186.23

From the previous statistics where players can take 480 rolls to pull a max potential, they would have gotten 180 weapon rolls. In this case, they will be short of 160 more. Supplementing this will be dependent on the pull economy, and also how the sold packs or the transfer rate from origeometry to arsenal tickets will be.

P2P Endfield vs. Other Games

CHARACTER BANNER

10000 experiments	Arknights: Endfield [6 copies]	Arknights (standard banner) [6 copies]	Hoyoverse [7 copies]	Wuthering Waves [5 copies + 2 'free']
Average pulls to max copies	480	378	654	397
5th percentile	307	200	468	258
95th percentile	720	616	842	536

To get maximum copies, Arknights still definitely has it the best although limited banners are not discussed here, which could turn it to the worst if you want both characters max potential.

Wuthering Waves is cheapest to max copy a character amongst the big games, with Endfield behind but all Hoyoverse titles even further. Again, this assumes that the cost to purchase a pull is the same across all games. It is estimated that it is about the same at \$2USD / pull in every one listed here.

Distribution curves for the character banners can be found in the appendix.

However this does not consider weapons, which is discussed below.

WEAPON BANNER

10000 experiments	Arknights: Endfield [6 copies]	Genshin Impact [5 copies, get 1 of 2 rate-up weapons]	Honkai: Star Rail [5 copies]	Wuthering Waves [5 copies]
Average pulls to max copies	340	443.32	352.76	264.26
5th percentile	180	300	233	175
95th percentile	500	584	481	341

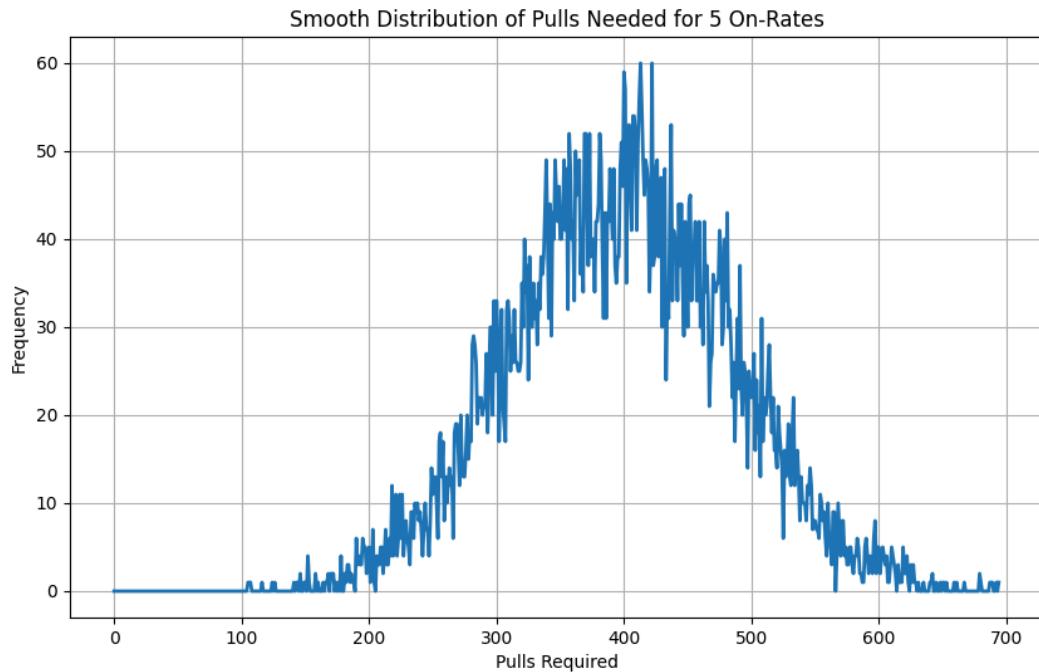
While pull economy is not accounted for, Endfield gives 180 pulls at 480 character banner pulls which would discount how much free pulls or spending is required.

Summary

Arknights: Endfield gacha on paper provides a better experience for free-to-play (who have patience to not pull every banner) while having a similar pay-to-play experience as Wuthering Waves. For it to exceed the other games or even its predecessor, it will need to have a more generous pull economy and better incentivising payments. The gacha could still however be worse, but it would take a stretch to be worse than the Hoyoverse titles.

APPENDIX

Wuthering Waves 5 Rate-up Characters Distribution



Hoyoverse 7 Rate-up Characters Distribution

