

First, we want the hit chance to be balanced. Since this will affect the critical hit chance, it will be meaningless if this basic hit chance is not balanced.

By saying balanced, it means that: if Player 1 makes a certain effort on attack and Player 2 makes the same effort on defense, the expected hit chance won't change.

The formula for calculating hit chance is:

$$C = [50 + (ATK_1 - DEF_2)]\%$$

If we want C won't change, it's obvious that:

$$ATK_1 - DEF_2 \equiv Constant$$

Which means that:

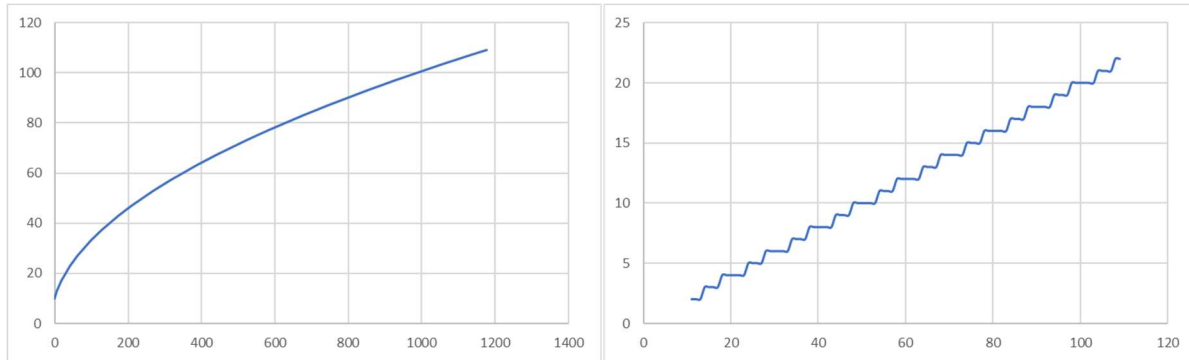
$$\Delta ATK = \Delta DEF$$

So, the growth curve of attack and defense should be identical.

We should also notice that, in this system, it's definitely a good choice to add defense as much as a player can. So we need to restrict the ability of adding points to defense. Using a curve with a decreasing derivative might be a good choice.

$$DEF(Point) = \left\lfloor \sqrt{(Point + 10) \times 10} \right\rfloor$$

Where *Point* means the total point that is applied to defense.



These two charts show the relation between the points that will be applied to defense and the actual value of defense. In the first chart, the X Axis represents the points that a player applies, and Y Axis means the defense that the player will have with these points all applied to defense. We can see that the increase speed of defense is becoming slower as the player keeps applying points to defense. The X Axis of the second chart is the current defense value, and Y Axis is the points that needed to be applied if the player wants to gain another defense value, or to say, cost to upgrade. The chart is basically linear. It won't cost too much for a player to add his defense, but it will cost more and more. Since the growth curve of attack and defense should be identical, the growth of attack will also be calculated in the same way.

$$ATK(Point) = \left\lfloor \sqrt{(Point + 10) \times 10} \right\rfloor$$

Next, we want the critical hit chance and critical mitigation to be balanced. Also, by saying balanced, it means that the expectation of the damage of a critical hit should be kept the same if two players applied the same point to CRT and MTG.

Suppose that we find a formula for CRT and MTG that will prevent this expectation from changing. As a player leveled up, his CRT will increase too. To make the expectation the same, the enemy also needs to increase his MTG for a certain amount. Player 1 can have more critical hits, and player 2 will mitigate that critical hit more. In general, the expectation of the damage is the same, but the problem is that the randomness of a critical hit will be decreased. It's like that a player is rolling a dice labeled with 1, 2, 3, 4, 5, 6 when he has a small amount of CRT, and rolling a dice labeled with 3.5, 3.5, 3.5, 3.5, 3.5, 3.5 when he has a large amount of CRT. Without this kind of randomness, we can't call a critical hit a critical hit. It becomes a basic hit when both players have big CRT and MTG value. So, my answer for this is that these two values should not be changed by the player. It can be a part of the battle system and can be slightly changed when the player used some skills, but they should not be variables for players.

For the last variable, health, I think it should not be changed neither. Since the final damage will be constrained in $0 \sim 5$, if the health increases, the player and his opponent will both take much more time or rounds in killing each other, which I believe is not balanced.

I believe the problem with this system is that the ATK and DEF is wrongly defined, and CRT and MTG being variables. The ATK and DEF in this system looks more like hit rate and evasion rate because they won't actually affect the maximum of the final damage, which makes it impossible to increase the health. And for CRT and MTG, they cannot be significantly changed because this will affect the randomness of the critical hit.

To summarize my answer, the cost to upgrade ATK and DEF should be linearly increased to prevent the DEF become too big. CRT, MTG and HP should be kept the same.