Idleon Formulas v0.2

on Legends of Idleon v1.21

21/05/2021

Sacrezar

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1 Introduction

This PDF is interactive if you download it, which might be more comfortable to use.

TODO:

Note:

- BUG NOTE: in game bug note.
- TODO: todo note, it's for me or for those who want to contribute.
- Note: information note, general information.
- Bold red text important.

1.1 Special thanks

Xores, LiuLangZhe, Rockangelz, Sonnenlicht and the wiki team as well as discord's mods! and LavaFlame2 obviously.

1.2 Last modifications

2021/06/06 - Add:

- family bonuses;
- construction and worship xp formulas;
- some Shaman Skills formulas and graphs;
- % chance to hit depending on the accuracy;
- some star talents;
- food consumption;
- Shrine time lvl up;
- refinery cap/combustion/power.

2021/05/25 Add cauldron new bubble cost formula + some typo.

2021/05/24 Add cost formula for p2w tab (thx LiuLangZhe).

2021/05/23 Add Stamps, Statues and others formulas + some references.

2021/05/22 Init.

2 Global

2.1 XP needed to IvI up

Every skills use the same formula except Smithing, Alchemy, Construction and Worship. **TODO:** I have to verify this; might be wrong now

$$\begin{split} XP_{\text{Class}} &= \left[\left(15 + \text{lvl}^{1.9} + 11 \times \text{lvl} \right) \times \left(1.208 - \min \left\{ 0.164, \frac{0.215 \times \text{lvl}}{\text{lvl} + 100} \right\} \right)^{\text{lvl}} - 15 \right] \\ XP_{\text{Skill}} &= \left[\left(15 + \text{lvl}^2 + 15 \times \text{lvl} \right) \times \left(1.225 - \min \left\{ 0.164, \frac{0.135 \times \text{lvl}}{\text{lvl} + 50} \right\} \right)^{\text{lvl}} - 30 \right] \\ XP_{\text{Smithing}} &= \left[\left(15 + \text{lvl}^2 + 13 \times \text{lvl} \right) \times \left(1.225 - \min \left\{ 0.164, \frac{0.135 \times \text{lvl}}{\text{lvl} + 50} \right\} \right)^{\text{lvl}} - 30 \right] \\ XP_{\text{Alchemy}} &= \left[\left(15 + \text{lvl}^2 + 15 \times \text{lvl} \right) \times \left(1.225 - \min \left\{ 0.18, \frac{0.135 \times \text{lvl}}{\text{lvl} + 50} \right\} \right)^{\text{lvl}} - 30 \right] \\ XP_{\text{Construction}} &= \left[\left(10 + \text{lvl}^{2.81} + 4 \times \text{lvl} \right) \times \left(1.117 - \frac{0.135 \times \text{lvl}}{\text{lvl} + 5} \right)^{\text{lvl}} - 6 \right] \\ XP_{\text{Worship}} &= \left[\left(15 + \text{lvl}^{1.3} + 6 \times \text{lvl} \right) \times \left(1.17 - \min \left\{ 0.07, \frac{0.135 \times \text{lvl}}{\text{lvl} + 50} \right\} \right)^{\text{lvl}} - 26 \right] \end{split}$$

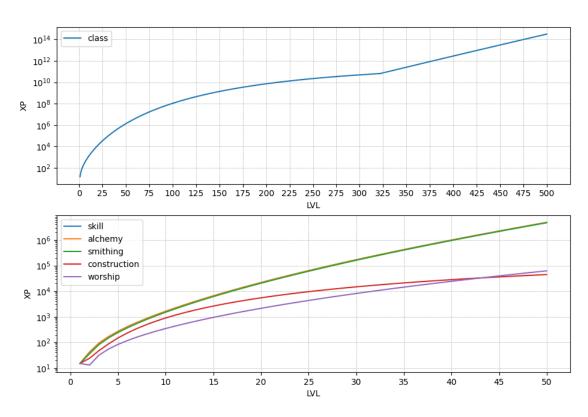


Figure 2.1.1: XP needed per level

2.2 Fighting Formulas

2.2.1 Damage done

$$Damage_{max} = Damage_{max} \times Mastery$$

Note: Mastery caps at 80%.

2.2.2 Damage taken per hit

$$dmgPerHit = \left\lceil \frac{attack_{enemy} - 2.5 \times defense^{0.8}}{max \left\{ 1, 1 + \frac{defense^{1.5}}{100} \times \frac{defense}{max \left\{ 1, attack_{enemy} \right\}} \right\}} \right\rceil$$

2.2.3 AFK damage cap

TODO:

2.2.4 Food Consumption

$$Grasslands = \frac{dmgPerHit*300}{min\{foodHeal, maxhp\}}$$

$$Desert = \frac{dmgPerHit*500}{min\{foodHeal, maxhp\}}$$

$$Tundra = \frac{dmgPerHit*600}{min\{foodHeal, maxhp\}}$$

2.2.5 Hourly Kill Cap

TODO:

2.2.6 % chance to hit depending on the accuracy

$$hitChance = 100 \times \left(0.95 \times \frac{3 \times yourAcc}{2 \times acc} - 0.425\right)$$

• acc is the accuracy needed to have a 100% chance to hit.

2.2.7 Multikill

TODO:

2.2.8 Sampling

TODO:

Just a guess as of now but it might be nbKills \times baseDropChance \times sampling% where BaseDropchance is unaffected by drop rate.

2.3 Family Bonuses

$$Archer = 1 + \left\lfloor \frac{lvl - 9}{5} \right\rfloor$$

$$Hunter = \frac{(lvl - 29) \times 30}{lvl + 71}$$

$$Bowman = \frac{(lvl - 29) \times 38}{lvl + 71}$$

$$\begin{aligned} \text{Mage} &= 1 + \left\lfloor \frac{lvl - 9}{5} \right\rfloor \\ \text{Wizard} &= 1 + \left\lfloor \frac{lvl - 29}{8} \right\rfloor \\ \text{Shaman} &= 1 + \frac{(lvl - 29) \times 0.4}{lvl + 71} \end{aligned}$$

$$\begin{aligned} Warrior &= 1 + \left\lfloor \frac{l \nu l - 9}{5} \right\rfloor \\ Barbarian &= \frac{(l \nu l - 29) \times 25}{l \nu l + 71} \\ Squire &= \frac{(l \nu l - 29) \times 40}{l \nu l + 71} \end{aligned}$$

$$Journeyman = 1 + \left\lfloor \frac{lvl - 9}{5} \right\rfloor$$

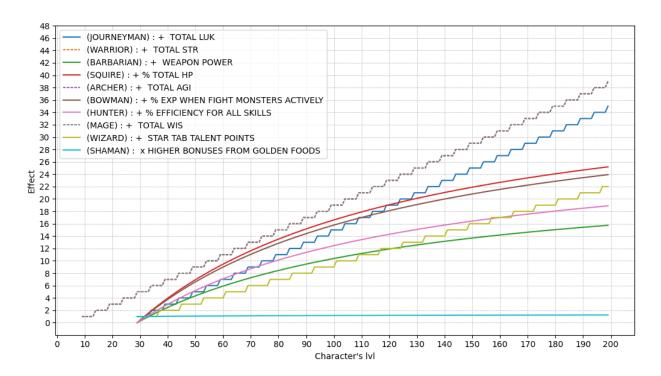


Figure 2.3.1: Bonuses scaling per character IvI

3 Guilds

TODO:

4 Talents

4.1 Shaman

4.1.1 Bubble Breakthrough

BUG NOTE: XP doesn't work (v1.21)

$$\begin{aligned} xp\% &= l\nu l \\ odds\% &= \frac{51 + 0.5(l\nu l - 1)}{50} \times l\nu l \end{aligned}$$

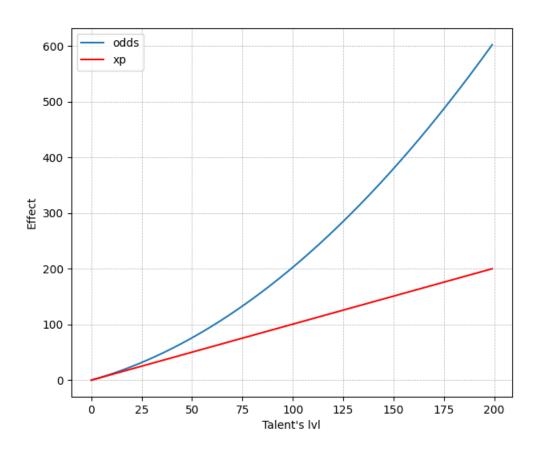


Figure 4.1.1: Bubble Breakthrough Effect

4.1.2 Virile Vials

$$damage_{\%} = nbVials \times \frac{12*lvl}{lvl + 100}$$

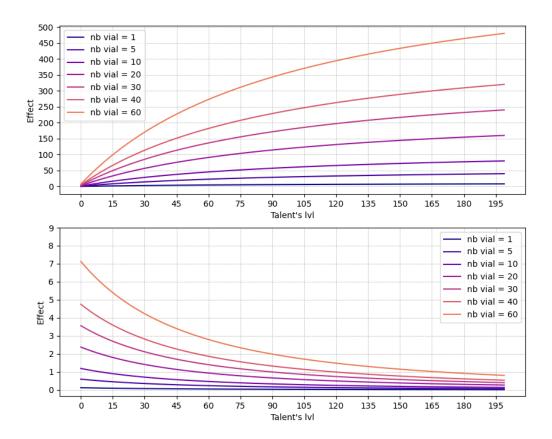


Figure 4.1.2: Virile Vials effect

4.2 Star Talents

4.2.1 Stonks!

$$Points = \frac{130 \times x}{x + 50}$$

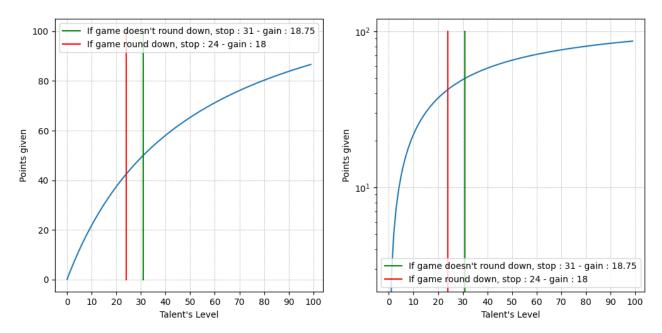


Figure 4.2.1: Where to stop leveling up Stonks! (with/out logarithmic scaling)

4.2.2 Tick Tock

$$AFKGainRate\% = \frac{8l\nu l}{l\nu l + 50}$$

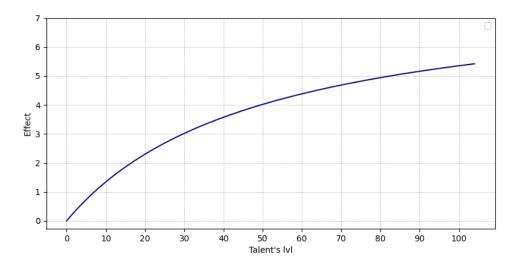


Figure 4.2.2: Tick Tock Effect

4.2.3 Just EXP

$$\mathsf{AFKGainRate}_\% = \frac{\mathsf{10lvl}}{\mathsf{lvl} + \mathsf{50}}$$

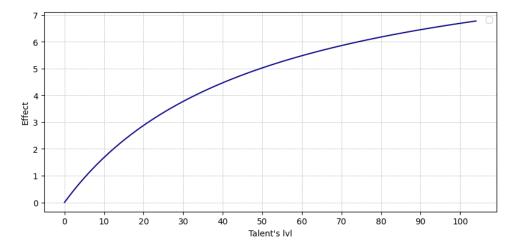


Figure 4.2.3: Just EXP Effect

4.2.4 Printer Sampling

$$Sampled = 10 + 0.075 * lvl$$

4.2.5 Shrine Architect

$$AFKGainRate_{\%} = \frac{50lvl}{lvl + 50}$$

So for each afk claim, shrines would gain afkTime × AFKGainRate%:

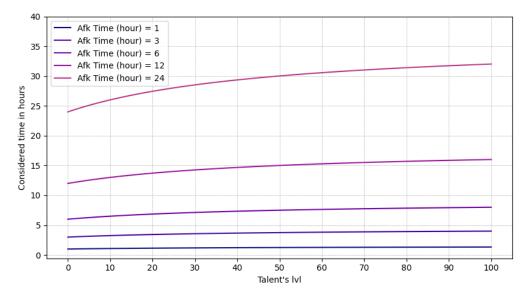


Figure 4.2.4: Shrine Architect Effect considering afk claim time

5 Alchemy

Here is your base brewspeed, as well as your xp/hour:

$$p2wBonus = AlchSpeedP2W \times AlchLvl \\ talentBonus = BusyBrewing + BrokenTime + GuildPerk + StarSigns$$

IF WIS < 1000: wisBonus =
$$\frac{(WIS + 1)^{0.37} - 1}{40}$$
ELSE: wisBonus =
$$0.5 \times \frac{(WIS - 1000)}{WIS + 2500} + 0.255$$

$$\begin{aligned} & Bonus = p2wBonus \times \left(1 + \frac{wisBonus}{0.6}\right) \times \left(1 + \frac{talentBonus}{100}\right) \\ & brewSpeed = \left\lfloor AlchLvl^{0.8} \right\rceil \times \left(1 + \frac{stamp + Bubble + Box}{100}\right) \times \left(1 + \frac{Bonus}{100}\right) \end{aligned}$$

$$xp_{hour} = brewSpeed \times alchExpMultiplier$$

Multiply $xp_{/hour}$ by 15 if you are in a cauldron, by 30 if you are in liquid.

BUG NOTE: GuildPerk doesn't work as of version 1.20b but it should be fixed with the next patch.

Note: xp/hour on AFK seems to misbehave. When testing I got some weird results: As if my character was in Cauldron whereas it was in liquid.

5.1 Liquid & Cauldron

5.1.1 Liquid

$$liquid_{/\text{hour}} = \left(1 + \frac{\text{decant}_{\%} + \text{RLP2W}_{\%} + \text{vial}_{\%}}{100}\right) \times \left(1 + \frac{\text{stamp}_{\%} + \sum \left((\text{alchLvl} * 2 + 4)^{0.65}\right)}{100}\right)$$

TODO: ADD SALT LICK FACTOR

- RLP2W_% is P2W Liquid Regen, see 5.3.
- stamp_% is Drippy Drop Stamp.
- decant_% is regen decanting.

Multiply liquid $_{
m /hour}$ by 1.5 if you bought the gem upgrade.

As you can see, the vial effect is rather insignificant. Characters IvI can't be bought, you just have to wait. So it lets us with $decant_{\%}$, $RLP2W_{\%}$ and $stamp_{\%}$. Whether or not to "waste" water is up to you, but do know that in the long run $decant_{\%}$ is at the moment the most powerful upgrade.

As for RLP2W_% and $stamp_{\%}$, it's up to you to know which one will have the most impact, but here is a graphic showing % gained based on the cost (doesn't take into account material cost):

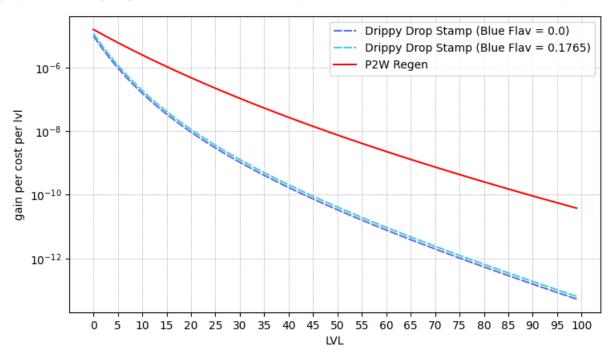


Figure 5.1.1: Gain per cost based comparison of P2W Regen and Drippy Drop

5.1.2 Cauldron

newBubbleCost =
$$3 + (3n)^{2.2} \times 1.3^n$$

• n is your number of bubbles unlocked.

TODO:

5.2 Bubble

TODO:

5.3 P2W tab

Every p2w related formulas

5.3.1 Cauldron

$$\begin{split} \text{regen}_{\%} &= \frac{16 + 0.5 \times (\text{regenLvl} - 1)}{15} \times \text{regenLvl} \times 3 \\ \text{regen}_{\text{Cost}} &= \left\lfloor 2500 \left(1.15 - \frac{0.117 \text{regenLvl}}{100 + \text{regenLvl}} \right)^{\text{regenLvl}} \right] \\ \text{newBubble} &= 1 + \frac{\text{newBubbleLvl} \times 2.5}{\text{newBubbleLvl} + 100} \\ \text{newBubble}_{\text{Cost}} &= \left\lfloor 3200 \left(1.18 - \frac{0.145}{100 + \text{newBubbleLvl}} \right)^{\text{newBubbleLvl}} \right) \\ \text{boostReqLow}_{\%} &= \frac{70 \times \text{boostLvl}}{100 + \text{boostLvl}} \\ \text{boostReqLow}_{\text{Cost}} &= \left\lfloor 3750 \left(1.2 - \frac{0.14 \text{boostLvl}}{100 + \text{boostLvl}} \right)^{\text{boostLvl}} \right] \end{split}$$

5.3.2 Vials

$$cap = capLvl$$

$$cap_{Cost} = \left\lfloor 10000 \times 2^{capLvl} \right\rfloor$$

$$rng = \frac{250 \times rngLvl}{100 + rngLvl}$$

$$rng_{Cost} = \left\lfloor 5000 \times 1.25^{rngLvl} \right\rceil$$

BUG NOTE: rng doesn't work at the moment (v1.14).

5.3.3 Player

$$\begin{split} & \text{AlchSpeed}_{\%} = \frac{35 \times \text{AlchSpeedLvl}}{100 + \text{AlchSpeedLvl}} \\ & \text{AlchSpeed}_{\text{Cost}} = \left[4000 \left(1.15 - \frac{0.1 \text{AlchSpeedLvl}}{100 + \text{AlchSpeedLvl}} \right) \right] \\ & \text{ExtraXP}_{\%} = \frac{11 + 0.5 \times (\text{ExtraXPLvl} - 1)}{10} \times \text{ExtraXPLvl} \\ & \text{ExtraXP}_{\text{Cost}} = \left[6000 \left(1.15 - \frac{0.09 \text{AlchSpeedLvl}}{100 + \text{AlchSpeedLvl}} \right) \right] \end{split}$$

5.3.4 Liquid

$$\begin{split} \text{regen}_{\%} &= \frac{400 \times \text{regenLvl}}{100 + \text{regenLvl}} \\ \text{regen}_{\texttt{Cost}} &= \left\lfloor 2500 \left(1.19 - \frac{0.135 \text{regenLvl}}{100 + \text{regenLvl}} \right)^{\text{regenLvl}} \right] \end{split}$$

$$cap = capLvl$$

$$cap_{Cost} = \left[3500 \left(1.2 - \frac{0.13capLvl}{100 + capLvl} \right)^{capLvl} \right]$$

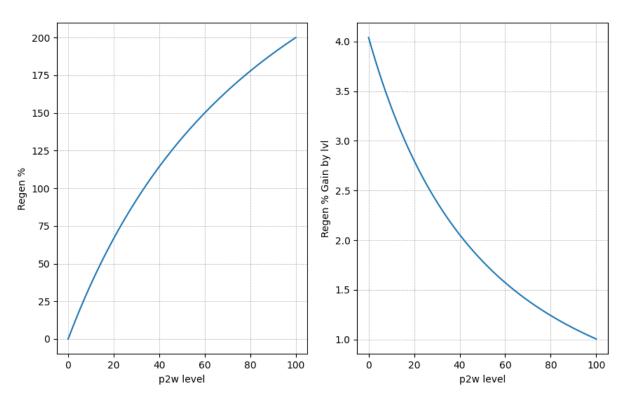


Figure 5.3.1: How much regen you gain with p2w

6 Post Office

6.1 Simple Shippin Orders

TODO:

6.2 Plan-it Express Orders

TODO:

6.3 Dudes Next Door

TODO:

6.4 Shipments

Beware, the prowess effect in each Shipment affect only the concerned skill although it's only written "prowess".

6.4.1 Civil War Memory

$$\begin{aligned} \text{damage}_{\text{base}} &= \text{lvl} \\ \text{fightGain}_{\%} &= 13 \times \frac{\text{lvl} - 25}{\text{lvl} - 25 + 200} \\ \text{crit}_{\%} &= 10 \times \frac{\text{lvl} - 100}{\text{lvl} - 100 + 200} \end{aligned}$$

6.4.2 Locally Sourced Organs

$$\begin{aligned} \text{maxHP} &= 1 + \left\lfloor \frac{l \nu l}{2} \right\rfloor \\ \text{maxHP}_{\%} &= 0.1 (l \nu l - 25) \\ \text{selfHeal}_{\%} &= 25 \times \frac{l \nu l - 100}{l \nu l - 100 + 200} \end{aligned}$$

6.4.3 Magician Starterpack

$$\begin{aligned} \text{maxMP} &= 1 + \left\lfloor \frac{\text{lvl}}{3} \right\rfloor \\ \text{maxHP}_{\%} &= 0.1(\text{lvl} - 25) \\ \text{fasterCD} &= 17 \times \frac{\text{lvl} - 100}{\text{lvl} - 100 + 200} \end{aligned}$$

6.4.4 Bolvl of Unwanted Stats

accuracy = 0.25lvl
defence =
$$0.3(lvl - 25)$$

 $MobExp\% = 29 \times \frac{lvl - 100}{lvl - 100 + 170}$

6.4.5 Dwarven Supplies

$$\begin{split} \text{efficiency}_{\text{mining}} &= 50 \times \frac{\text{lvl}}{\text{lvl} + 200} \\ \text{prowess}_{\%} &= 40 \times \frac{\text{lvl} - 25}{\text{lvl} - 25 + 150} \\ \text{AFKGain}_{\text{mining}} &= 15 \times \frac{\text{lvl} - 100}{\text{lvl} - 100 + 175} \end{split}$$

6.4.6 Blacksmith Box

$$\begin{split} XP_{Smithing} &= 50 \times \frac{lvl}{lvl + 200} \\ prodSpeed_{\%} &= 75 \times \frac{lvl - 25}{lvl - 25 + 200} \\ toCraft_{\%} &= 30 \times \frac{lvl - 100}{lvl - 100 + 150} \end{split}$$

6.4.7 Taped Up Timber

$$efficiency_{choppin} = 50 \times \frac{lvl}{lvl + 200}$$

$$prowess_{\%} = 40 \times \frac{lvl - 25}{lvl - 25 + 150}$$

$$AFKGain_{choppin} = 15 \times \frac{lvl - 100}{lvl - 100 + 175}$$

6.4.8 Carepack From Mum

$$\begin{split} &\text{notConsume}_\% = 23 \times \frac{\text{lvl}}{\text{lvl} + 200} \\ &\text{hFoodEffect}_\% = 30 \times \frac{\text{lvl} - 25}{\text{lvl} - 25 + 150} \\ &\text{pFoodEffect}_\% = 30 \times \frac{\text{lvl} - 100}{\text{lvl} - 100 + 175} \end{split}$$

6.4.9 Sealed Fishheads

$$efficiency_{fishing} = 50 \times \frac{lvl}{lvl + 200}$$

$$prowess_{\%} = 40 \times \frac{lvl - 25}{lvl - 25 + 150}$$

$$AFKGain_{fishing} = 15 \times \frac{lvl - 100}{lvl - 100 + 175}$$

6.4.10 Potion Package

$$brewSpeed_\% = 70 \times \frac{lvl}{lvl + 200}$$

$$alchXP_\% = 60 \times \frac{lvl - 25}{lvl - 25 + 150}$$

$$craniumTime = 0.1(lvl - 100)$$

6.4.11 Bug Hunting Supplies

$$efficiency_{catching} = 50 \times \frac{lvl}{lvl + 200}$$

$$prowess_{\%} = 40 \times \frac{lvl - 25}{lvl - 25 + 150}$$

$$AFKGain_{catching} = 15 \times \frac{lvl - 100}{lvl - 100 + 175}$$

6.4.12 Non Predatory Loot Box

$$\begin{split} dropRate_\% = 50 \times \frac{l\nu l}{l\nu l + 200} \\ Luck = 0.25(l\nu l - 25) \\ crystalSpawn_\% = 65 \times \frac{l\nu l - 100}{l\nu l - 100 + 200} \end{split}$$

7 Construction

7.1 Refinery

Note: Power Cap is hardcoded

$$\begin{aligned} \text{powerPerCycle} &= \left \lfloor \text{rank}^{1.3} \right \rfloor \\ &\text{CostsMulti} &= \text{baseMat} \times \left \lfloor \text{rank}^{1.5} \right \rfloor \end{aligned}$$

Same but per hour:

$$\begin{aligned} \text{powerPerCycle}_{/\text{hour}} &= \frac{1}{\text{baseTime} \times (1 - \text{cycleTimeReduction})} \times \left \lfloor \text{rank}^{1.3} \right \rfloor \\ &\text{CostsMulti}_{/\text{hour}} = \text{baseMat} \times \frac{1}{\text{baseTime} \times (1 - \text{cycleTimeReduction})} \times \left \lfloor \text{rank}^{1.5} \right \rfloor \end{aligned}$$

- baseMat: base cost for material (same for salt if you're wondering);
- baseTime: Base time 0.25 for first tab, 1 for second.
- cycleTimeReduction : SpdBonus
- SpdBonus: bonuses affecting cycle speed (salt lick upgrade or vial).

Calculations you may want to do:

$$\begin{split} nbCyclesToRankUp &= \frac{powerCap}{\left \lfloor rank^{1.3} \right \rfloor} \\ timeToRankUp &= nbCyclesToRankUp \times baseTime \times (1-cycleTimeReduction) \end{split}$$

7.2 Cost

TODO: Add cost (build and resources cost) for every building

7.3 Cogs generation

TODO: Add Xores' explanation about cogs

7.4 Shrine

$$timeToLvlUp = \left\lfloor 20(lvl - 1) + 6lvl \times 1.63^{lvl - 1} \right\rfloor$$

TODO: bonus per lvl

7.5 Buildings

7.5.1 Salt lick upgrade

Upgrade	Base cost	Χ
1	5	1.5
2	100	1.8
3	5	2.2
4	250	1.3
5	5	2.2
6	100	1.2
7	5	2
8	100	1.3
9	5	2.2
10	250	1.1

$$upgrade_{SaltPrice} = \left\lfloor x^{l\nu l} * baseCost \right\rfloor$$

8 Worship

TODO:

- tower cost scalability
- points per mob per wave
- hp scalability if there is any
- soul and xp gained

9 Other

9.1 Teleportation Cap

$$TP_{cap} = 21(1+n)$$

Where n is the number of time you bought Daily Teleports.

9.2 Statues

$$Cost = \left\lfloor lvl^{1.17} \times 1.35^{\frac{lvl}{10}} + 1 \right
ceil$$
 $Bonus = \left\lfloor Base \times lvl \right\rceil$

9.3 Stamps

$$baseCost_{Coin} = Price_{base} \times \left(1 - \frac{bribe}{100}\right)$$

BUG NOTE: As of v1.14, the bribe effect is 8%, not 5%.

$$\begin{split} & Cost_{Coin} = \left(1 - \frac{\text{vial}_{\%}}{100}\right) \times \left\lfloor baseCost_{Coin} \times \left(i_{10} - \left(\frac{lvl}{lvl + 5*lvlRange} \times 0.25\right)\right)^{lvl \times \frac{10}{lvlRange}}\right\rfloor \\ & Cost_{Material} = \left\lfloor baseCost_{Material} \times i_{8}^{\left\lfloor \frac{lvl}{lvlRange-1} \right\rfloor \cdot 8}\right\rfloor \right\rfloor \times max \left\{0.1, 1 - \frac{\text{vial}_{\%}}{100}\right\} \end{split}$$

- vial% is the Blue Flav vial effect.
- lvlRange is the number of time you can lvl up a stamp before having to pay using materials.
- i_8 and i_{10} are value you can find in the code or in the wiki, look for data-i in the .stampdiv of the stamp you want to know about.

TODO: Skill Stamp cap formula

9.4 Forge

TODO: point cost, xp/speed/capa gained per point used

References

- [1] LavaFlame2. Legends of Idleon.
- [2] Idleon Wiki.
- [3] Jeremy Criquet. Idleon Calculator.
- [4] Zaghrenaut#9386. Idleon Post Office Calculator.
- [5] LiuLangZhe#9086. Cumulative Cost Calculator.