

# PoGo Kit

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## Abstract

This is a draft of some Pokmon GO formulas.

## 1 Calculating TDO

Real damage formula:

$$RealDamage = Floor(\frac{1}{2} * Power * \frac{Atk}{Def} * Multipliers) + 1 \quad (1)$$

Simplified damage formula:

$$Damage = \frac{1}{2} * Power * \frac{Atk}{Def} * Multipliers \quad (2)$$

Auxiliary:

$$FastPPT = FastPower \div Turns \quad (3)$$

$$FastEPT = EnergyDelta \div Turns \quad (4)$$

$$ChargePPE = ChargePower \div EnergyDelta \quad (5)$$

$$HP = Sta * CPM_{lvl} \quad (6)$$

Damage per Turn (DPT):

$$FastDPT = \frac{1}{2} * FastPPT * \frac{Atk}{Def} * Multipliers \quad (7)$$

$$ChargeDPT = \frac{1}{2} * ChargePPE * FastEPT * \frac{Atk}{Def} * Multipliers \quad (8)$$

$$\begin{aligned} DPT &= FastDPT + ChargeDPT \\ DPT &= \frac{FastPPT * Atk}{2Def} + \frac{ChargePPE * FastEPT * Atk}{2Def} \\ DPT &= (FastPPT + ChargePPE * FastEPT) * \frac{Atk}{2Def} \end{aligned} \quad (9)$$

The Pokmon stays alive for some turns (TotalTurns):

$$\begin{aligned}
TotalTurns_A &= HP_A \div DPT_B \\
TotalTurns_A &= HP_A \div (FastPPT_B + FastEPT_B * ChargePPE_B) * \frac{Atk_B}{2Def_A} \\
TotalTurns_A &= \frac{HP_A}{FastPPT_B + FastEPT_B * ChargePPE_B} * \frac{2Def_A}{Atk_B}
\end{aligned}
\tag{10}$$

How to calculate TDO:

$$\begin{aligned}
TDO &= DPT_A * TotalTurns \\
TDO &= (FastPPT_A + FastEPT_A * ChargePPE_A) * \frac{Atk_A}{2Def_B} \\
&\quad * \frac{HP_A}{FastPPT_B + FastEPT_B * ChargePPE_B} * \frac{2Def_A}{Atk_B} \\
TDO &= (FastPPT_A + FastEPT_A * ChargePPE_A) * Atk_A * HP_A * Def_A \\
&\quad * \frac{1}{(FastPPT_B + FastEPT_B * ChargePPE_B) * Atk_B * Def_B} \\
TDO &\propto (FastPPT_A + FastEPT_A * ChargePPE_A) * Atk_A * HP_A * Def_A
\end{aligned}
\tag{11}$$