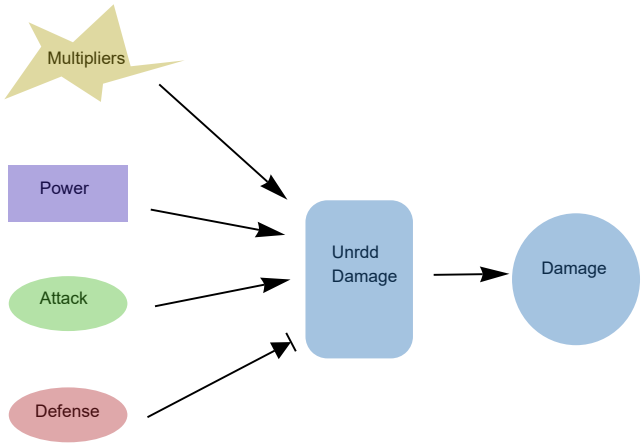
Damage Formula



Unrounded Damage =

$$\frac{1}{2} * \text{Power} * \frac{\text{Attack}}{\text{Defense}} * \text{Multiplier}$$

Damage =

$$\lfloor \text{Unrounded Damage} \rfloor + 1$$

Power is a property of the move that you can look up on Bulbapedia. NOTE: Moves have different power if you're in a Gym battle or a Trainer battle! https://bulbapedia.bulbagarden.net/wiki/List_of_moves_(GO)

Attack is the true attack stat of the **attacking Pokemon**.

Defense is the true defense stat of the **defending Pokemon**.

Multiplier is described below.

Multipliers

Trainer Attack Bonus (applies to all trainer battles)

This multiplier is 1.3 during a trainer battle and 1 otherwise.

STAB (Same Type Attack Bonus)

This multiplier is 1.2 if the type of the move used matches the type of the attacking Pokemon and 1 otherwise.

Type Effectiveness Bonus

This multiplier is based on the type chart below.

If there are many multipliers, multiply them together to get the final multiplier for the formula.

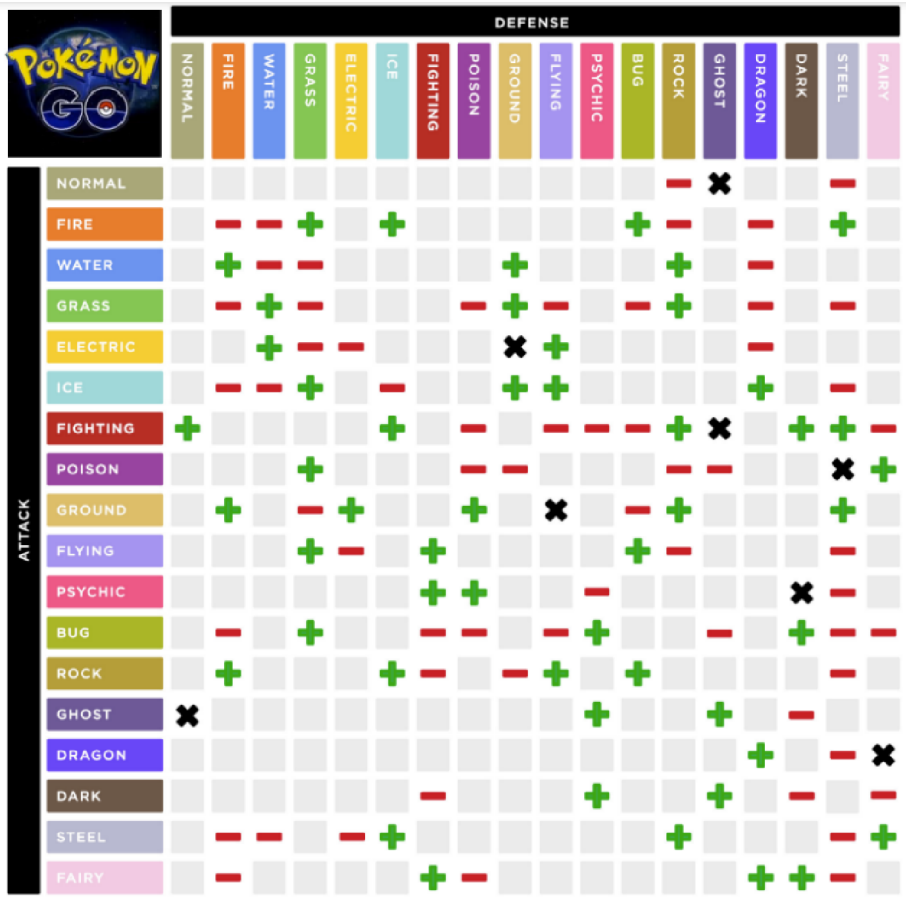
Other Multipliers

There are other multipliers based on friendship, weather, and shadow Pokemon. However, we will not deal with them in this class.

Type Effectiveness Chart

TYPE OF DEFENDING POKEMON

Type of Attacking MOVE



Type Effectiveness Multiplier

Find the row corresponding to the type of the move used by the attacking Pokemon. Find the column corresponding to the type of the defending Pokemon.

\+ Means “super effective” so the multiplier is 1.6

-- Means “not very effective” the multiplier is .625

X Means “almost immune” so the multiplier is (.625)*(.625) = .390625

Defenders with Two Types

If the defender has two types, do the process above for each type. Then multiply the two results together.

Damage Formula Examples

Pikachu vs Pidgey

Let's say Pikachu uses Quick Attack against Pidgey in a Trainer Battle.

Pikachu is an Electric type Pokemon, Attack = 50, Defense = 45, HP = 55

Quick Attack is a Normal type move, Power = 5

Pidgey is a Normal/Flying type Pokemon, Attack = 40, Defense = 35, HP = 51

$$\text{Damage} = \left\lfloor \frac{1}{2} * \text{Power} * \frac{\text{Attack}}{\text{Defense}} * \text{Multiplier} \right\rfloor + 1$$

Multiplier: We are in a trainer battle (1.3), have no STAB (1), and check the table and see normal effectiveness on both of Pidgey's types (1*1). So our multiplier is 1.3 * 1 * (1*1) = 1.3

We plug in: $\left\lfloor \frac{1}{2} * 5 * \frac{50}{35} * 1.3 \right\rfloor + 1 = 5$

Vaporeon vs Flareon

Let's say Vaporeon uses Water Gun against Flareon in a Trainer Battle.

Vaporeon is a Water type Pokemon, Attack = 75, Defense = 65, HP = 100

Water Gun is a Water type move, Power = 3

Flareon is a Fire type Pokemon, Attack = 99, Defense = 54, HP = 95

$$\text{Damage} = \left\lfloor \frac{1}{2} * \text{Power} * \frac{\text{Attack}}{\text{Defense}} * \text{Multiplier} \right\rfloor + 1$$

Multiplier: We are in a trainer battle (1.3), Vaporeon gets STAB on Water Gun (1.2) and we check the table and see super effective on Flareon's type (1.6). So our multiplier is 1.3 * 1.2 * 1.6 = 2.496

We plug in: $\left\lfloor \frac{1}{2} * 3 * \frac{75}{54} * 2.496 \right\rfloor + 1 = 6$

Golurk vs Vivillion

Let's say Golurk uses Mud-Slap against Vivillion in a Trainer Battle.

Golurk is a Ground/Ghost type Pokemon, Attack = 150, Defense = 133, HP = 111

Mud-Slap is a Ground type move, Power = 11

Vivillion is a Bug/Flying type Pokemon, Attack = 121, Defense = 94, HP = 107

$$\text{Damage} = \left\lfloor \frac{1}{2} * \text{Power} * \frac{\text{Attack}}{\text{Defense}} * \text{Multiplier} \right\rfloor + 1$$

Multiplier: We are in a trainer battle (1.3), Golurk gets STAB on Mud-Slap (1.2) and we check the table and see “not very effective” and “nearly immune” on Vivillion’s type (.390625*.625). So our multiplier is 1.3 * 1.2 * .390625 * .625 = .380859375

We plug in: $\lfloor \frac{1}{2} * 11 * \frac{150}{94} * .380859375 \rfloor + 1 = 5$