**Item level**, sometimes shortened to **ilvl**, is the effective level of an item, hidden in-game. The minimum character level required to use an item is ilvl – 5 (capped at 60).

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**Terms and definitions**

* **StatValue** — the amount of a given stat on an item.
* **StatMod** — the weighting given to a specific stat, this is how stats are compared in value.
* **ItemValue** — the total value of the stats on an item.
* **SlotMod** — weighting for adjusting the value of an item based on equipment slot.
* **ItemSlotValue** — this is the ItemValue modified for the item slot.

**Calculating Item Level**

This calculation is a three step process. First, the individual stats are each multiplied by their modifiers and taken to the 1.5 power, these terms are summed up and taken to the .667 power. The result, the Item Value, is a direct measure for the item's quality. It represents the feeling how "good" an item is.

* ItemValue = [(StatValue[1]\*StatMod[1])1.5 + (StatValue[2]\*StatMod[2])1.5 + ...]2/3 / 100

Next, this sum is modified by the slot (or item type):

* ItemSlotValue = ItemValue \* SlotMod

The final modification takes into account item quality. The end result is a calculated value for item level.

* Green: ilvl = (ItemSlotValue + 9.8) / 1.21
* Blue: ilvl = (ItemSlotValue + 4.2) / 1.42
* Epic: ilvl = (ItemSlotValue - 11.2) / 1.64

This calculated item level matches Blizzards item level quite well.

A few remarks on the ItemValue formula:

1. It is quite simple, but not so simple that it is just all the stats added together.
2. Each stat is taken to the 1.5 power. This isn't too fast of a growth, but it does cause a single high stat to be weighted fairly heavily. For example, if we had two green leg items, one with +15 to a single stat and another +9 and +10 on two different stats, their calculated item levels would be 20.5 and 20.6.
3. After summing the series of stats to the 3/2 power, the total sum is taken to the 2/3 power, to keep the ItemValue scale linearly with the item level (not with a power).

**StatMods**

The numbers for StatMod are given in arbitrary units. The base was taking 100 for +heal, the factors for the other modifiers were reverse-engineered from there. Most probably Blizzard uses a different base, but it should not matter, as all that is important is the ratio between the stats, not the absolute value.

Due to the nature of the formula, an item of the same level can have more of a stat with a low stat mod, than with a high one. So for example 1% Crit = 14 Agility and 5 mana regen/5 = 12 Spirit.

|  |  |
| --- | --- |
| **Stat** | **StatMod** |
| Armor | 22 |
| Attack Power vs (demons, beasts, undead) | 76 |
| Ranged Attack Power | 92 |
| Spell Healing | 100 |
| Attack Power | 115 |
| Blocking Value | 150 |
| Spell Damage (One school) | 159 |
| Spell Damage (All Spells) | 192 |
| Magic Resist (One school) | 230 |
| Primary Stat (STR, AGI, STA, INT, SPI) | 230 |
| Defense | 345 |
| Regen per 5 sec (Health or Mana) | 550 |
| Weapon skill (other) | 550 |
| Weapon skill (daggers) | 720 |
| Damage Shield | 720 |
| % chance to Block | 1300 |
| % chance to hit | 2200 |
| % chance to hit with all spells | 2500 |
| % chance to Dodge | 2500 |
| % chance to crit with all spells | 2600 |
| % chance to crit | 3200 |
| % chance to Parry | 3600 |

Notes:

* +Holy has value of 210 on some items

These stat mods were obtained by evaluating several thousands of items. Some values (esp. str, int, resists, +spell damage) are pretty reliable since they occur on many items and in large values. Others, such as %crit, %tohit, %spellcrit are much rougher as they dont appear much and then only in small values (1 or 2%). Items that have nothing else except for 1 or 2 of these less common stats sometimes wont fit in at exactly the ilvl you would expect because getting 1 more of that stat would push it far too high.

Some of these weightings seem to be different on different item types. This is certainly the case for weapons, but also for rings and necks. For example, rings can get higher resist values than their ilvl would imply, so they have a slightly lower StatMod for resists. They have a higher StatMod for x/5 health regen though. There are a few scattered stats that are this way, but overall they make a relatively small impact.

**Slot Modifiers**

Some item types have better or more stats than items that go in different slots. Helms for for example will always give better benefits than bracers of the same item level. A high number in this table means that the item will have worse stats than an item for a slot with a lower number and the same ilvl.

|  |  |
| --- | --- |
| **Slot** | **SlotMod** |
| Head, Chest, Legs | 1 |
| Shoulder, Hands, Waist, Feet | 1.35 |
| Trinket | 1.47 |
| Wrist, Neck, Back, Finger | 1.85 |
| 2H weapon | 1 |
| 1H weapon | 2.44 |
| Ranged | 3.33 |
| Off-hand/Shield | 1.92 |

The values for weapons and off-hand are not exact and should be used very carefully.

**Weapons DPS Trade**

Neither casters nor feral druids benefit from weapon DPS. Thus some high end weapons may have some of their DPS sacrificed in favor of spell damage or feral attack power.

SacrificedDPS = ilvl-60

Added Spell Damage and Healing = 4\*SacrificedDPS

Added School Spell Damage = 5\*SacrificedDPS

Added Spell Healing = 7.66\*SacrificedDPS

Added Feral Attack Power = 14\*SacrificedDPS or ( Expected weapon dps - 42.4 ) \* 15.4

Notes:

* Sacrificed DPS may vary by a bit either way. However (ilvl-60) generally works
* Sacrificed DPS creates additional stat points which are spent in those stats.
* For majority of high end weapons all those mods come only as a result of DPS sacrifice.
* Feral Attack Power is found only on 3 weapons so far and both formulas generally fit.

**Procs and uses effects**

The stat mods table contains the most frequently appearing stats. There are other stats which are sometimes unique or difficult to describe. All procs fall in this category, as do all Use:<do something> abilities. While these don't fit with an immediately obvious value, this system can be used to see what the blizzard item designers think they are worth and translate them into a stat-equivalent format.

**Armor Scaling**

Armor values on items follow a simple linear scaling pattern within certain limits. For example, mail armor scales linearly between certain ilvls, at which points the slope of the linear increase changes. One of these points is ilvl 45, above this point it scales more rapidly. Remember that an ilvl 45 item can be worn at lvl 40, and shamans and hunters get mail at 40. So they wanted mail to scale up fast for those classes, but without raising the amour values of pre-40 warriors too high. An example of armor scaling is shown below.

Green Plate Chest AC = (ilvl-44) \* 8.9 + 428

The armor value of rare or epic pieces is also very easy to obtain using a simple multiplier. If you really want to go into detail, you will notice that there are plate chests with ilvls below 44. Due to their ilvl they should be equippable below lvl 40 (if any class could) and follow a different scaling equation (which is why jouster plate stuff has such pitiful armor values compared to many other starting plate item, their ilvls are all low).

For Items of the same armor type (cloth, leather, etc) and the same ilvl

* Rare Armor Value = Green Armor Value \* 1.1
* Epic Armor Value = Green Armor Value \* 1.2

The exception to this is shields, which use a slightly different scaling

* Rare Shield Armor Value = Green Shield Armor Value \* 1.125
* Epic Shield Armor Value = Green Shield Armor Value \* 1.25

Of course there are items with much higher armor than others around that lvl. Those items are using the extra armor as an actual stat. Only this extra armor, above and beyond the predicted armor is considered in item weighting. So while the base armor level of an item is free, going higher will cost you other stats.