

# Villager Mechanics

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# Villager Basics

# Villager Tech Overview

Villagers have become one of the most impactful additions to Minecraft for many years, and their use only continues to grow as new updates give them more purpose. While understanding that a villager can give you some new items, villagers are possibly the most complex area of technical Minecraft to learn. This is because Villagers have a lot that go on behind the visible game in order to execute all the possible actions that are available. While most entities are only capable of a couple of useful functions, Villagers are more human like and perform more human like actions, which have a much deeper pool of mechanics that are specific to them. The range of these mechanics is so large to this one entity, that an entire area of tech was born around it with various fields within it.

This page will provide a brief overview of Villager tech, looking at what fields of tech exist within the scope of Villagers, and some basic ideas to understand to dive into the Testificate rabbit hole. The [Villager Mechanics Book](#) will have more pages which take a deeper dive into the various mechanics regarding Villagers.

## What is Villager Tech?

As one might be able to guess given the name of the field, [Villager Tech](#) refers to mechanics, contraptions, and data that surrounds the Minecraft entity of the same name. Villager tech is arguably one of the most important areas of technical Minecraft because of how vital Villagers are to progression in a world. Despite being so useful, Villager tech is not as well versed by many players compared to other areas of tech. This is likely due to the frustrating nature of Villagers, which can seem unpredictable from less visual cues to indicate their mechanics. However, Villagers have a very logical system in which they work from, and when understood, can be used to make working with Villagers much more manageable.

## Villager Tech Fields

Villagers have only a handful of fields that correspond to them. Each of these fields will have a page or pages dedicated to them. The sections below will provide a brief overview of what each field corresponds with and why they are useful.

1. Iron Golems
2. Trading
3. Raids
4. Breeding

## 5. Crop Farming

### Iron Golems

**Iron Golems** are the protectors of Villagers, but we instead like to harvest the material they are made out of. This field of Villager tech deals with the mechanics behind how Iron Golems spawn as well as the process for killing them. Since Iron is one of the most used materials in the game for making many redstone components, **Iron Farms** end up being one of the staple farms that a player should make. As such, a lot of research has went into this field to optimize Iron Farms for all. This field refers to the mechanics surrounding Iron Golems spawned from Villagers, and how to kill them efficiently.

### Trading

Ever since Villagers were given the ability to trade items, they have been one of the most powerful entities in the game, offering a wide variety of resources that no other source can compete with. The Village and Pillage update expanded this further to provide a more robust economic system for Villagers and added a lot more mechanics that expand on this system. This field refers to Villagers' ability to buy and sell resources. Included in this field are trade prices, discounts, restocking, and anything else relating to trading with a Villager.

### Raids

The Village and Pillage update brought with it a new mechanic for Villagers to have a threat against them, where **Illagers** are able to attack Villages in a **Raid**. These events host a good haul of resources that can be used in your world, and so tech players decided that farming them was a good idea (it was). This field of Villager tech refers to the mechanics of Raids, Illagers, and farming them effectively. This field could also fall under Mob Farming based on its nature.

### Breeding

Since Villagers do not respawn naturally, the only way to make more is to breed them. Villagers have a slightly deeper system of mechanics in order to reproduce, and so this field began. Albeit the smallest field of Villager tech, if you want to perform any type of Villager tech in survival, you'll need to breed Villagers. This field refers to the mechanics behind breeding Villagers.

### Crop Farming

Villagers have the ability to plant and harvest crops, which allows them to reproduce automatically in a world without player interference. Using this mechanic, we can use Villagers to automate the production of crops which is not possible using any other method. This field refers to the mechanics of Villagers planting and harvesting crops.

Villager Basics

# Villages

# Point of Interest Blocks

**Point of Interest Blocks** (POI) are blocks that villagers can claim or "link" to and interact with. These blocks are what allow villagers to perform all tasks they are capable of doing. There are three types of POI in the game:

1. Beds
2. Bells
3. Job Blocks aka **Workstations**

Villagers will claim POI in precedence of the order listed above.

## Beds

Beds are the benchmark POI for villagers. When a villager claims a bed, a village is formed around it with the center being the north-west corner of the bed. This makes beds the most important POI for villagers and is necessary for nearly all villager functions. Beds have a claiming capacity of 1. Villagers will attempt to path-find to their claimed beds when night falls.

## Bells

Bells are listed as 'Meeting Place' in the JSON files. When a villager claims a bell, they will path-find towards it during the early evening of a day. Unlike beds and workstations, bells are not required for any form of villager tech, however they can be found useful for specific tasks that make working with villagers and villages easier. Up to 20 villagers can claim a single bell.

## Workstations

**Workstations** are the job blocks that villagers claim to have a profession and unlock trading. Villagers will path-find to their workstations during work periods. When a villager claims a workstation, the type of workstation claimed correlates to the type of profession the villager affiliates with. When the workstation is moved/broken, the villager will lose the profession and its trades. However, trading with a villager locks the villagers trades, and therefore will not change profession. A locked villager can only claim the workstation that matches their profession. **Nitwits** cannot claim workstations.

### List of Workstations

BlockSprite_composter.webp	Composter
BlockSprite_barrel.webp	Barrel
BlockSprite_fletching-table.webp	Fletching Table
BlockSprite_cartography-table.webp	Cartography Table
BlockSprite_smithing-table.webp	Smithing Table
BlockSprite_grindstone.webp	Grindstone
BlockSprite_blast-furnace.webp	Blast Furnace
BlockSprite_smoker.webp	Smoker
BlockSprite_cauldron.webp	Cauldron
BlockSprite_loom.png	Loom
BlockSprite_brewing-stand.webp	Brewing Stand
BlockSprite_lectern.webp	Lectern
BlockSprite_stonecutter.webp	Stonecutter

# Iron Farming



Iron Farming

# Iron Golem Spawning

Iron Farming

# Iron Golem Killing

# Trading

Trading

# Buying and Selling Resources

Trading

# Prices and Restocking

# Discount and Curing Mechanics

## Villager Discounts

As discussed in the [Buying and Selling Resources Page](#), trading is at the epicenter for progressing through a world; however, villagers are greedy scam artists that love to charge high prices for buying items and selling resources. As TMC is accustomed to finding the most efficient solutions to problems, we minimize the work we need to do to profit off of trading. The way we do this is by applying **discounts** to villagers to minimize their prices. There are a few different ways we can do this, which are all described in this page:

In Bedrock Edition, there are three different discounts we can apply to a villager. Two coming from **Zombie Villager Conversion**, and the other from **Raids**. The three discounts are as follows:

1. Direct Discounts
2. Area of Effect (AOE) Discounts
3. Hero of the Village (HDTV) Discounts

The strength of a discount, or how much the price of a trade decreases, varies based on the type of discount, and the **weight** of a trade.

## Trade Weights

Before we can dive into the types of discounts, we first need to discuss how different trades are affected by discounts, as some trades receive a larger discount than others.

**Economy Trades** aka **Non-Weighted Trades**, are trades that receive a normal discount amount. All "Sell" trades, and many "Buy" trades fall under this category. The "Buy" trades that fall under this category are usually basic resources and blocks.

**Regular Trades** aka **Weighted Trades**, are trades that receive a higher discount. The trades that fall under this category are equipment items such as tools, weapons, armor, and other special items that are related. A list of all weighted trades is below.

## List of Weighted Trades

	All Helmets
	All Chestplates
	All Leggings
	All Boots
	All Swords
	All Pickaxes
	All Shovels
	All Axes
	All Hoes
	Shield
	All Horse Armor
	Saddle
	Fishing Rod
	All Enchanted Books
	All Explorer Maps
	Bell

## Zombie Villager Conversion

During the release of the Nether Update (1.16), Villagers received parity with Java Edition to receive discounts when cured from being a Zombie Villager. The application of the discount(s) has changed over the years to make it more balanced. In it's first form, all villagers in a 16 block radius had **all** their prices reduced to 1 emerald. Not too long after in 1.16.100, the mechanics now were more similar to Java in which villagers received a fair discount from zombifying and curing, and nearby villagers received a small discount. This could be done multiple times to stack discounts on top of each other. This was the way curing based discounts were for a good amount of time. That was until 1.20.30, when the bug for multiple discounts being applied was fixed ([LIST BUG REPORT HERE](#)), meaning that only a single discount of each type could be applied to each villager. Which is where the mechanics have stayed until today.

Despite the 1 cure limit, Zombie Villager conversion remains the most efficient way to apply discounts to villagers. [Direct Discounts](#) and [AOE Discounts](#) provide enough of a discount to bring many trades down to 1 emerald/resource. These two discounts are usually stacked together automatically based on how they are applied.

Let's look at both discounts:

## Direct Discounts

**Direct Discounts** are the larger discount applied to a villager that was **directly** cured from being a Zombie Villager. These discounts are very powerful, providing the largest price reduction of all three discount types.

Trade Weight	Price Reduction
Non-Weighted Trade	-5
Weighted Trade	-20

Since the change to the discount system in 1.16.100, Direct discounts have remained a permanent effect. In game, a cured Villager will show a larger discount amount than the table above. This is because Villagers receive both a Direct and AOE discount when cured.

## Area of Effect Discounts

**Area of Effect Discounts** are the smaller discount applied to Villagers within a certain **area** around a Zombie Villager. When a Zombie Villager is cured, villagers within this area receive the AOE discount.

Trade Weight	Price Reduction
Non-Weighted Trade	-1
Weighted Trade	-5

AOE discounts are applied within a 16 block cuboidal radius, centered at the blocks the Zombie Villager occupies when converted. The area defined by this radius is 33x34x33 blocks (xyz).

Previously, these discounts were temporary, each AOE discount lasted 4 hours before the effect would wear off; However, when the 1 discount limit was introduced in 1.20.30, AOE discounts were made permanent alongside Direct discounts.

There is also currently a bug in which Zombie Villagers created from a Zombie Spawner provide AOE discounts to Villagers. Although the 1 discount limit now makes this exploit not worth utilizing since zombifying and curing the villagers will provide both discounts, and since AOE discounts are now permanent, there's no reason to re-zombify a villager, meaning the Zombie Villagers created to provide multiple, constant discounts are obsolete.

## Hero of the Village



Zombie Villager conversion may be the most efficient method of applying discounts, but it's not the only one. **Hero of the Village** is an effect which is obtained after successfully defeating a **Raid** which provides a small discount to all villagers you are able to trade with. Because this effect is applied to the player and not the villager, other players will not receive the discount unless they obtain the HOTV effect as well. HOTV lasts 40 minutes, making it the only temporary discount.

Instead of a set number that all prices are lowered by, HOTV instead reduces prices by decreasing their base cost by **30%** while the effect is active, regardless of trade weights. This means each price can have a different reduction applied to it. Because of this, the **HOTV Discount Chart** (LINK PAGE HERE ONCE MADE) will highlight all the discounted prices using HOTV.

Since HOTV is a temporary effect, and most trades can be reduced to a cost of 1 emerald/resource with Zombie Villager conversion, it is often not considered when discussing the maximum discount for Villagers.

If you're interested in making the most use out of HOTV, you'll need to use a **Pillager Outpost** in order to continuously start Raids. The best way to do this is to have a separate Village at the Pillager Outpost for just gaining HOTV, and your Trading Hall Village be nearby for trading.

## Total Discounts

This section will cover the total price reduction from only Direct and AOE discounts. For the full chart of all discounts and prices, see the **Total Discount Chart** page (LINK PAGE HERE ONCE MADE).

Trade Weight	Direct Price Reduction	AOE Price Reduction	Total Price Reduction
Non-Weighted Trade	-5	-1	-6
Weighted Trade	-20	-5	-25

Based on these discounts, all Non-Weighted trades need to have a cost of **7 or less**, and all Weighted trades need to have a cost of **26 or less** to achieve a 1 emerald/resource price.

# Raid Tech

# Raid Mechanics

Raid Tech

# Raid Waves

# Breeding

## Requirements

Most Villager tech requires many villagers to properly function, and Villagers do not naturally re-spawn in the world. Therefore, Breeding Villagers is an important field to understand in order to create many Villagers to use for your various contraptions.

Villagers have 3 requirements to breed baby Villagers:

## Outfits

Villagers can have different outfits depending on what Biome they were born in. When a baby Villager is born the outfit it dawns will be determined by the biome, and there is no association with the outfits the parents currently wear. As an example, if a Savanna Villager and a Desert Villager breed in a Tundra, a Tundra baby Villager will be born.

Knowing what biome(s) is linked to each outfit allows you to know where to find or create Villagers of a specific type. This is useful because outfits can determine certain trades offers. See [Buying and Selling Resources](#) for more info.

There are 7 types of outfits a Villager can have:

Possible Outfits	Associated Biomes
Desert	<ul style="list-style-type: none"><li>• <i>BiomeSprite badlands.png</i>: Sprite image for badlands in Badlands</li><li>• <b>BiomeSprite desert.png: Sprite image for desert Desert</b></li><li>• <i>BiomeSprite eroded-badlands.png</i>: Sprite image for eroded Badlands</li><li>• <i>BiomeSprite wooded-badlands.png</i>: Sprite image for wooded Badlands</li></ul>
Savanna	<ul style="list-style-type: none"><li>• <b>BiomeSprite savanna.png: Sprite image for savanna Savanna</b></li><li>• <i>BiomeSprite savanna-plateau.png</i>: Sprite image for savanna Plateau</li><li>• <i>BiomeSprite windswept-savanna.png</i>: Sprite image for windswept Savanna</li></ul>

Taiga	<ul style="list-style-type: none"> <li>• <i>BiomeSprite old-growth-pine-taiga.png</i>: Sprite image for Old Growth Pine Taiga</li> <li>• <i>BiomeSprite old-growth-spruce-taiga.png</i>: Sprite image for Old Growth Spruce Taiga</li> <li>• <b>BiomeSprite taiga.png: Sprite image for taiga in Minecraft</b></li> <li>• <i>BiomeSprite windswept-hills.png</i>: Sprite image for windswept Hills</li> <li>• <i>BiomeSprite windswept-forest.png</i>: Sprite image for windswept Forest</li> <li>• <i>BiomeSprite windswept-gravelly-hills.png</i>: Sprite image for windswept Gravelly Hills</li> </ul>
Snow	<ul style="list-style-type: none"> <li>• <i>BiomeSprite deep-frozen-ocean.png</i>: Sprite image for deep-frozen Ocean</li> <li>• <i>BiomeSprite frozen-ocean.png</i>: Sprite image for frozen Ocean</li> <li>• <i>BiomeSprite frozen-peaks.png</i>: Sprite image for frozen-peaks</li> <li>• <i>BiomeSprite frozen-river.png</i>: Sprite image for frozen-river</li> <li>• <i>BiomeSprite grove.png</i>: Sprite image for grove in Minecraft</li> <li>• <i>BiomeSprite ice-spikes.png</i>: Sprite image for ice-spikes</li> <li>• <i>BiomeSprite jagged-peaks.png</i>: Sprite image for jagged Peaks</li> <li>• <i>BiomeSprite snowy-beach.png</i>: Sprite image for snowy-beach</li> <li>• <b>BiomeSprite snowy-plains.png: Sprite image for snowy Plains</b></li> <li>• <i>BiomeSprite snowy-slopes.png</i>: Sprite image for snowy-slopes</li> <li>• <b>BiomeSprite snowy-taiga.png: Sprite image for snowy Taiga</b></li> </ul>
Jungle	<ul style="list-style-type: none"> <li>• <i>BiomeSprite bamboo-jungle.png</i>: Sprite image for bamboo Jungle</li> <li>• <i>BiomeSprite jungle.png</i>: Sprite image for jungle in Minecraft</li> <li>• <i>BiomeSprite sparse-jungle.png</i>: Sprite image for sparse Jungle</li> </ul>
Swamp	<ul style="list-style-type: none"> <li>• <i>BiomeSprite mangrove-swamp.png</i>: Sprite image for mangrove Swamp</li> <li>• <i>BiomeSprite swamp.png</i>: Sprite image for swamp in Minecraft</li> </ul>

Plains	<ul style="list-style-type: none"><li>• BiomeSprite meadow.png: Sprite image for meadow</li><li>• BiomeSprite plains.png: Sprite image for plains in</li><li>• <i>BiomeSprite sunflower-plains.png: Sprite image for</i></li><li>• All Other Biomes</li></ul>
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Note: Biomes in **Bold** denote that a Village naturally generates there

# Crop Farming



# Village Stacking