Tick System

- Normal ticking

    - Game Ticks
    - Redstone Ticks
    - Random Ticks

- Half ticks (C-Tick & P-Tick)
- Pending ticks
- Zero ticks

Normal ticking

Game Ticks

How the game runs

The Minecraft game engine progresses through time in steps called "ticks". In each second there are 20 "game ticks". There will never be more than 20 game ticks in a second, however, if there are less than 20 this means the game is lagging. Each tick includes processing most things in your Minecraft world. All ticks are calculated on the server that is running the world. As the server is calculating the ticks even if your FPS drops, your Minecraft world can still run at full speed. On the other hand, even if you have high FPS your TPS (ticks per second) can be below 20 making things in the world sluggish (such as mobs moving).

> Even in single-player sessions, there is a server running on the device that is calculating the ticks.

> If you are experiencing low TPS (ticks per second) in your Minecraft world constantly and want to upgrade your computer, upgrading your CPU will make the game run better as opposed to the GPU.

Things in the game that are controlled by game ticks:

- WIP

Redstone Ticks

How redstone is calculated

As opposed to game ticks, there are only 10 redstone ticks in a second. This makes each redstone tick last 100 milliseconds. In each redstone tick, there are two game ticks. Since Redstone ticks are run alongside game ticks, having less than 20 game ticks per second will slow down the speed of Redstone. On the other hand, if it takes a long time to process redstone for redstone ticks it can slow the game ticks down and lag your game.

Random Ticks

Half ticks (C-Tick & P-Tick)

Consumer and Producer ticks

In Bedrock edition each Redstone tick contains two Game ticks. However, unlike Java edition, the tick in the first and second half of the Redstone tick behave differently and serve different functions. The first half-tick in the Redstone tick is the Consumer tick (C-tick) and the second half is the Producer tick (P-tick). Outside of redstone components, both of these ticks function/serve the same purpose and have no difference.

C-tick and Consumers

C-ticks are the tick in the first half of the redstone tick. C-ticks affect only consumers (A list of all consumers is below). The C-tick travels and functions just like a normal redstone signal. However, C-ticks are limited to a single line of redstone dust as any method of extending the signal will require a producer, which can not be activated by a C-tick. C-ticks only function within the simulation distance of the world.

Consumers are defined by any redstone-related block that can interact with redstone but have no method of outputting a redstone signal (The exception is the target block see below). It is usually better to think of Consumers as any block that is not a Producer block. Or, Any block that can not output a redstone signal. Consumer block can either redirect or ignore redstone dust.

List of Consumer blocks

hopper_thumbnail.png	Hopper
tnt_side.png	TNT
trapdoor.png	Trapdoor / Door
fence_gate_3d.png	Fence Gate
rail_golden.png	Powered rail
rail_activator.png	Activator rail
command_block_front_mipmap.png	Command block
dragon_head.png	Dragon head / Piglin head
target_top.png	Target block (See more info below)

P-tick and Producers

P-ticks are the ticks that occur in the second half of a redstone tick. P-ticks only affect producers (A list of all producers is below). P-ticks can travel along redstone dust anywhere within the render distance. This means the area of effect for a P-tick is dependent on the client, not the server. A single P-tick traveling along redstone dust will not update the dust visually, the dust will look unpowered.

Producers are any redstone blocks that has the ability to output a redstone signal. A producer can not conduct a redstone signal, or in other words, they can not be solid (The exception is the target block see below). Most producers redirect dust and hard-power blocks on their "output" sides, however, some producers can soft power on other sides (lever, redstone torch, redstone block, etc.).

> A block will never be both a Consumer and a Producer. Even if the block can take a redstone input such as a repeater, it will always be a Producer and only take a P-tick as input.

List of Producer blocks

redstone_torch_on.png	Redstone torch
lever.png	Lever
image.png	Button
image.png	Pressure plate
image.png	Repeater
image.png	Comparator
observer_front.png	Observer
rail_detector.png	Detector rail
image.png	Sculk sensor
jukebox_top.png	Jukebox
trapped_chest_front.png	Trapped chest
daylight_detector_top.png	Daylight sensor
target_top.png	Target block (See more info below)

Target Block

WIP

Pending ticks

Zero ticks