Redstone Repeater ⚙ re article feedback

v t e *This article is about the block. For repeater circuits, see Transmission circuit § Repeater. For other uses, see Redstone.*

A **redstone repeater** is a block that produces a full-strength redstone signal from its front while its back is powered, with four toggleable delay settings. It can also be locked into its current power state by directly powering its side with another repeater or a redstone comparator.

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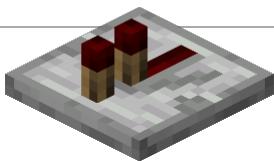
Redstone Repeater

Java Edition

Bedrock Edition

View all renders

Renewable	Yes
Stackable	Yes (64)
Tool	Any tool
Blast resistance	0
Hardness	0
Luminous	No
Transparent	Yes
Waterloggable	**JE:** No **BE:** Yes
Flammable	No

Catches fire from lava	No

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Obtaining

Breaking

A redstone repeater can be broken instantly using any tool, or without a tool, and drops itself as an item. To remove a redstone repeater, mine it.

Block	🔴🔴 Redstone Repeater
Hardness	0
Breaking time (secs)	
Default	*0.05*

Legend

- ▫ | | incorrect tool, drops nothing
- ▫ | | correct tool, drops nothing or something other than the block itself
- ▫ | | correct tool, drops the block itself
- ▪ *italicized* can be instant mined

A redstone repeater is removed and drops as an item if:
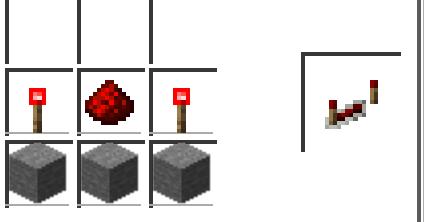
- its attachment block is moved, removed, or destroyed;
- water or lava flows into its space;[*Java Edition only*]
- a piston tries to push it or moves a block into its space.

Natural generation

A single redstone repeater is generated naturally in each jungle pyramid.

8-13 redstone repeaters can also generate in ancient cities.

Crafting

Ingredients	Crafting recipe	[hide]
Redstone Torch + Redstone Dust + Stone		

A redstone repeater generated in the jungle temple's hidden room.

Usage

See also: Redstone circuit

A redstone repeater can be used in four different ways: to "repeat" redstone signals back to full strength, delay signals, prevent signals moving backward, or to "lock" signals in one state.

A repeater can be placed only on top of full blocks (dirt, stone, etc.), on top of upside-down slabs, upside-down stairs, furnaces, and glass. In *Bedrock Edition*, a repeater can also be placed on fences and stone walls. They can also be placed on some transparent blocks. See Opacity/Placement for more information. To place a repeater, use the Place Block control.

A redstone repeater has a front and back – the arrow on the top points to the repeater's front. A repeater also has two small redstone torches on its top – the color of the torches indicates whether its output is on (dark red when off, bright red when on) and the distance between them indicates the delay the repeater adds to the signal transmission.
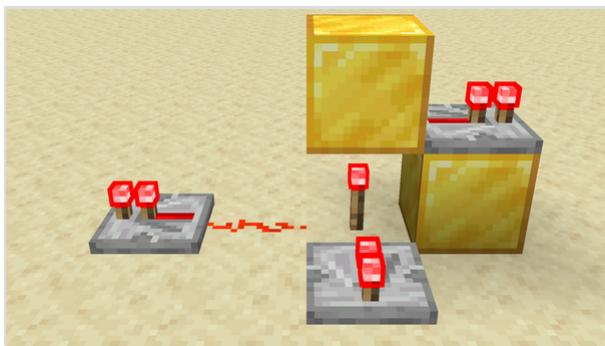
A repeater is 0.125 ($\frac{1}{8}$) blocks high.

Signal transmission

A repeater transmits signals only from its back to its front, but its behavior can be modified from the side (see signal locking, below).

A redstone repeater can be powered by any of the following components at its back:

Different ways to power a repeater

- an active power component (redstone torch, lever, block of redstone, etc.)
- powered redstone dust
- a powered redstone comparator or another powered redstone repeater facing the repeater
- a powered conductive block (including any conductive mechanism components, such as dispensers, redstone lamps, etc.)

A redstone repeater can power any of the following components at its front:

- redstone dust

- a redstone comparator or another redstone repeater facing away from the repeater
- any conductive block (including any conductive mechanism components)

A redstone repeater can activate any mechanism component it is facing.

A conductive block powered by a redstone repeater is called "strongly-powered" (as opposed to a conductive block "weakly-powered" by redstone dust). A strongly-powered conductive block can power adjacent redstone dust, as well as other redstone components.

Signal repeating

>   See also: Transmission circuit § Repeater

A redstone repeater can "repeat" a redstone signal, boosting it back up to power level 15.

Redstone signals have a maximum power level of 15 and that level drops by 1 for every block of redstone dust the signal travels through. If a signal must travel through more than 15 blocks of redstone dust, a redstone repeater can be used to boost the signal back up to full strength. An extra two blocks of distance can be achieved by placing conductive blocks before and after the repeater.

While redstone repeaters can allow signals to travel great distances, each always adds some delay to the transmission since the minimum amount of delay is 2 game ticks (0.1 seconds).

Signal delay

When initially placed, a redstone repeater has a delay of 2 game ticks (0.1 seconds).

A repeater's delay can be modified by using the Use Item control. Each use increases the repeater's delay by two ticks, to a maximum of eight, then reverting back to two ticks. Longer delays can be made with multiple repeaters – for example, a repeater set to '8' and another to '2' provides a half-second delay (8 × 0.05s + 2 × 0.05s = 0.5s).

Setting	Delay
1st	2 game ticks (0.1 seconds)
2nd	4 game ticks (0.2 seconds)
3rd	6 game ticks (0.3 seconds)
4th	8 game ticks (0.4 seconds)

A repeater set to a delay of four to eight ticks increases the length of any shorter on-pulse to match the length of the repeater's delay, and suppresses any shorter off-pulse. For example, a repeater set to a 4-tick delay changes a 0-tick[Java Edition only], 1-tick, 2-tick, or 3-tick on-pulse into a 4-tick on-pulse, and does not allow through any off-pulse shorter than 4 ticks (except for the caveats below). In *Java Edition*, a repeater set to a delay of two ticks can also extend the length of any 0-tick or 1-tick pulse.

Although a repeater cannot be set to have a delay of zero, in *Java Edition*, instant repeater

circuits are possible (circuits that repeat a signal with no delay).

In *Java Edition*, when and whether a repeater turns on or off in reponse to changes in the input signal is affected by scheduled ticks. Upon receiving a block update, an unpowered repeater receiving a signal will schedule a tick to turn on. Immediately before turning on, and subsequently whenever it is updated, the repeater will check whether it is still receiving a signal, and if not, it will schedule a tick to turn off. Once the tick runs, the repeater will only turn off if it is still not receiving a signal, and will otherwise stay on at least until the next scheduled tick, if any. However, only one tick can be scheduled at a time, and any attempt to schedule a tick while one already exists is completely ignored. As a consequence, even a very short off-pulse can cause a repeater to turn off, if it happens to occur at the same time as a previously scheduled tick to turn off. A locked repeater completely ignores all block updates and scheduled ticks.

Signal direction

See also: Mechanics/Redstone/Transmission circuit § Diode

A redstone repeater acts as a diode – it allows redstone signals through in one direction (unlike redstone dust or conductive blocks that can transmit redstone signals in any direction).

A diode can be used to protect a redstone circuit from redstone signals feeding back into the circuit from its output, or can be used to isolate one part of a circuit from another.
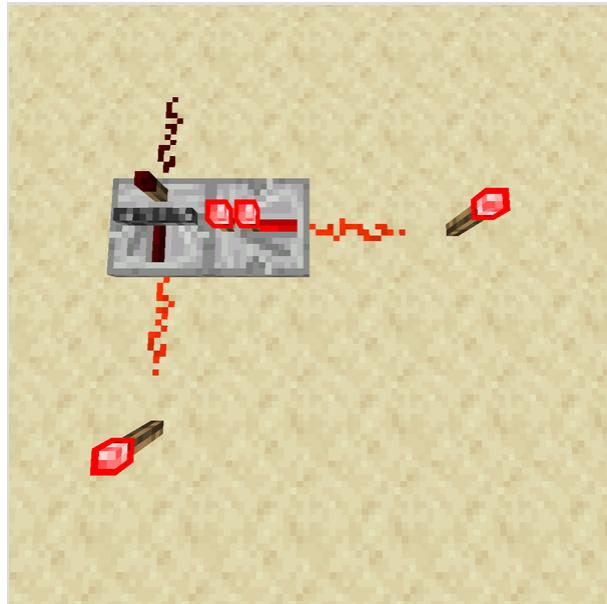
Signal locking

See also: Mechanics/Redstone/Memory circuit

A redstone repeater can be "locked" by another powered redstone repeater facing its side. When locked, the repeater does not change its output (whether powered or unpowered), no matter what the input does. When the side repeater turns back off, the repeater returns to its normal behavior.

A repeater can also be locked by a powered redstone comparator facing its side. This offers additional possibilities for locking signals because a comparator's output can be affected from 3 sides as well as by containers.

If a repeater is locked again too quickly after unlocking (e.g. the lock is controlled by a fast clock circuit), or the lock and the input are changed only on the same tick (e.g. because they're fed by the same clock and both repeaters have the same delay), the repeater does not switch states.

The left repeater has been locked in an unpowered output state by the right repeater.

Sounds

Java Edition:

	stone sound type							[hide]
Sound	**Closed captions**	**Source**	**Description**	**Identifier**	**Translation key**	**Volume**	**Pitch**	**Attenuation distance**
	Block broken	Blocks	Once the block has broken	`block .stone .break`	`subtitles .block .generic .break`	1.0	0.8	16
	Block placed	Blocks	When the block is placed	`block .stone .place`	`subtitles .block .generic .place`	1.0	0.8	16
	Block breaking	Blocks	While the block is in the process of being broken	`block .stone .hit`	`subtitles .block .generic .hit`	0.25	0.5	16
	Something falls on a block	*Entity-Dependent*	Falling on the block with fall damage	`block .stone .fall`	`subtitles .block .generic .fall`	0.5	0.75	16
	Footsteps	*Entity-Dependent*	Walking on the block	`block .stone .step`	`subtitles .block .generic .footsteps`	0.15	1.0	16

Bedrock Edition:

	wood sound type						[hide]
Sound	Closed captions [*upcoming: BE 26.0*]	Source	Description	Identifier	Translation key [*upcoming: BE 26.0*]	Volume	Pitch
	Block broken	Blocks	Once the block has broken	`dig .wood`	`subtitles .block.generic .break`	1.0	0.8-1.0
	Block broken	Blocks	When the block is placed	`dig .wood`	`subtitles .block.generic .break`	1.0	0.8
	Block breaking	Blocks	While the block is in the process of being broken	`hit .wood`	`subtitles .block.generic .hit`	0.23	0.5
	Footsteps	Players	Falling on the block with fall damage	`fall .wood`	`subtitles .block.generic .footsteps`	0.4	1.0
	Footsteps	Players	Walking on the block	`step .wood`	`subtitles .block.generic .footsteps`	0.3	1.0
	Footsteps	Blocks	Jumping from the block	`jump .wood`	`subtitles .block.generic .footsteps`	0.12	1.0
	Footsteps	Blocks	Falling on the block without fall damage	`land .wood`	`subtitles .block.generic .footsteps`	0.18	1.0

Data values

ID

Java Edition:

Name	Identifier	Form	Translation key	[hide]
Redstone Repeater	`repeater`	Block & Item	`block.minecraft.repeater`	

Bedrock Edition:

Redstone Repeater	Identifier	Numeric ID	Form	Item ID[i 1]	[hide] Translation key
Unpowered block	unpowered_repeater	93	Block & Ungiveable Item[i 2]	Identical[i 3]	—
Powered block	powered_repeater	94	Block & Ungiveable Item[i 2]	Identical[i 3]	—
Item	repeater	419	Item	—	item.repeater .name

1. ID of block's direct item form, which is used in savegame files and addons.
2. Unavailable with /give command
3. The block's direct item form has the same ID as the block.

Block states

See also: Block states

Java Edition:

Name	Default value	Allowed values	Description	[hide]
delay	1	1 2 3 4	The redstone repeater's delay in redstone ticks (double game ticks).	
facing	north	east north south west	The direction from the *output* side to the *input* side of a repeater. The opposite from the direction the player faces while placing the repeater.	
locked	false	false true	True if the repeater is currently locked.	
powered	false	false true	If the redstone repeater is lit.	

Bedrock Edition:

Name	Metadata Bits	Default value	Allowed values	Values for Metadata Bits	Description [hide]
minecraft:cardinal_direction	Not Supported	south	east north south west	Unsupported	The direction from the *output* side to the *input* side of a repeater. The opposite from the direction the player faces while placing the repeater.
repeater_delay	0x4 0x8	0	0 1 2 3	0 1 2 3	The redstone repeater's delay in redstone ticks (double game ticks) minus 1.

Videos

Note: The first video is from Java Edition 1.5, so it does not tell that redstone repeaters can now be placed on glass, ice, glowstone and sea lanterns.
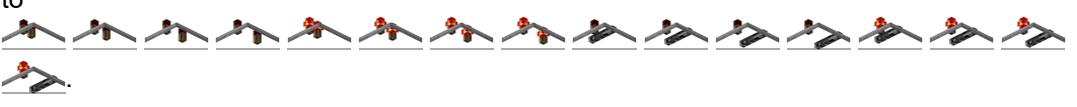
History

There is an associated page listing all historical changes related to the appearance and/or sounds associated with this block in further detail than below; see /Asset history.
There is an associated technical blocks page for the internal item form of this block; see

Technical blocks/Redstone Repeater.
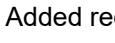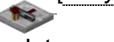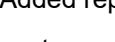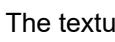
Java Edition

	Java Edition Beta		[hide]
	1.3		Added redstone repeaters.
			Originally, the four possible settings were "1, 2, 5 and 7",[1] but Jeb decided to change the settings to "1, 2, 3, and 4".[2]
			The particles when breaking redstone repeaters erroneously use the pumpkin top texture.
1.6	**Test Build 3**		The breaking particles of redstone repeaters now use the stone slab top texture, even though none of the elements on the model use it.
	1.7		The side texture of redstone repeaters has been changed to the previous bottom part of the texture.
			The breaking particles of redstone repeaters have been changed to a mix of stone slab, unlit redstone torch and unpowered repeater top when unpowered and a stone slab, lit redstone torch and powered repeater when powered.
			Redstone dust now automatically connects to the input of a redstone repeater. Previously, it needed to be specifically pointed toward the repeater like with other blocks.
	1.7.3		The breaking particles of redstone repeaters have been changed to simply an unlit redstone torch when unpowered and a lit redstone torch when powered.
	Java Edition		[hide]
1.0.0	**RC1**		Redstone dust now visually connects to the output of redstone repeaters, though this does not change its behavior.
1.3.1	**12w22a**		Redstone repeaters now naturally generate inside jungle temples.
			Repeaters are no longer being stuck when loading the chunks they are in.
	1.3		The texture of redstone repeater items have been changed.
1.4.2	**12w42a**		The top texture of redstone repeaters has been changed.
			Added repeater locking to redstone repeaters. Interestingly, the smallest face of the bedrock cuboid's texture changes depending on the delay, but the other two faces remain the same. When/if this changed is unknown.
1.5	**13w02a**		The side textures of redstone repeaters have been changed to use the top texture of stone slabs.
1.8	**14w06a**		Repeaters no longer produce block light when powered.
	14w10a		Torches on repeaters no longer have protruding features.
			The torches underneath redstone repeaters have been shortened, which has changed the underside textures from

to

.

	14w10b	Repeater torches now have protruding features again.[3]
	14w25a	The torches on redstone repeaters are now affected by directional shading.
		The breaking particle of redstone repeaters has been changed once again and now matches the top texture of redstone repeaters.
1.9	**15w46a**	Mobs no longer spawn on redstone repeaters.
1.13	**17w47a**	Redstone repeaters now render their underside, which has changed their undersides from to .
1.14	**18w43a**	The textures of redstone repeaters have been changed.
	18w50a	As the texture of bedrock has been changed, the textures of locked redstone repeaters have also been changed.
	19w12b	Redstone repeaters can now be placed on glass, ice, glowstone and sea lanterns.
1.19	**22w13a**	Redstone repeaters now generate in ancient cities.
1.20.2	**23w33a**	Redstone repeaters now use stone sounds instead of wood sounds.[4]
1.21.2	**24w33a**	The powered models for redstone repeaters have changed.

Bedrock Edition

Pocket Edition Alpha			[hide]
v0.14.0	**build 1**	Added redstone repeaters.	
Bedrock Edition			[hide]
1.2.0	**beta 1.2.0.2**	Redstone repeaters now render their underside, which has changed their undersides from to .	
1.10.0	**beta 1.10.0.3**	The textures of redstone repeaters have been changed.	

Legacy Console Edition

Legacy Console Edition								[hide]
Xbox 360	Xbox One	PS3	PS4	PS Vita	Wii U	Switch		
TU1	CU1	1.00	1.00	1.00	Patch 1	1.0.1		Added redstone repeaters.
TU19	CU7	1.12	1.12	1.12				[*verify*] Added repeater locking to redstone repeaters.
TU57	CU49	1.57	1.56	1.56	Patch 27	1.0.7		Redstone Repeaters can now be crafted from granite, andesite, diorite and their polished variants.
			1.90					The textures of redstone repeaters have been changed.

New Nintendo 3DS Edition

New Nintendo 3DS Edition		[hide]
0.1.0		Added redstone repeaters and repeater locking.

Data history

Java Edition

Java Edition			[hide]
1.13	17w47a	All 3 IDs for the redstone repeater have been merged into 1 ID: `repeater`.	
		Added powered block state to redstone repeaters.	
		Prior to *The Flattening*, these blocks' numeral IDs were 93 and 94, and the item's 356.	

Bedrock Edition

Bedrock Edition			[hide]
1.20.30	Preview 1.20.30.20	Redstone repeaters now use the `minecraft:cardinal_direction` block state instead of `direction`.	

Issues

Issues relating to "Repeater*" are maintained on the bug tracker. Issues should be reported and viewed there (https://bugs.mojang.com/issues/?jql=project%20in%20%28MC%2C%20MCPE%29%20AND%20%28resolution%20is%20EMPTY%20OR%20resolution%20in%20%281%2C%202%2C%206%29%29%20AND%20%28summary%20~%20%22repeater%2A%22%29%20ORDER%20BY%20resolution%20DESC).

Trivia
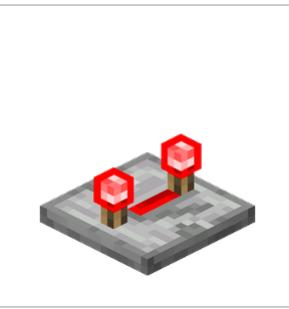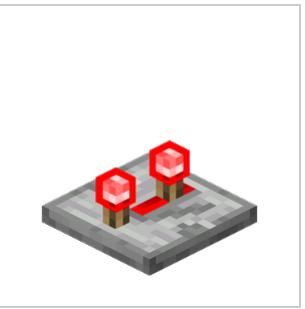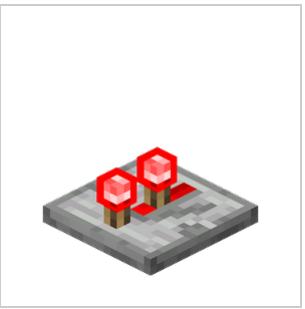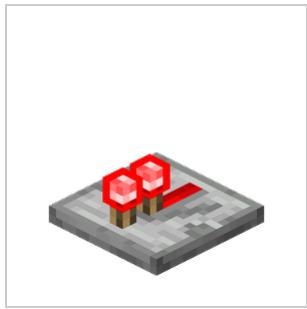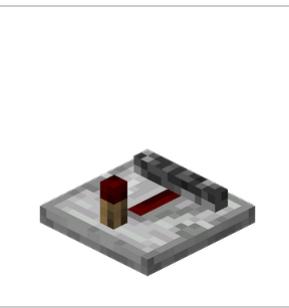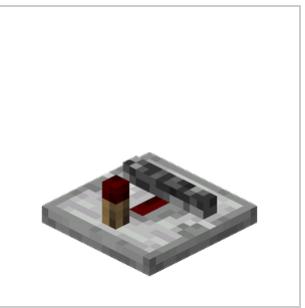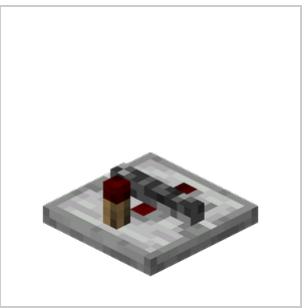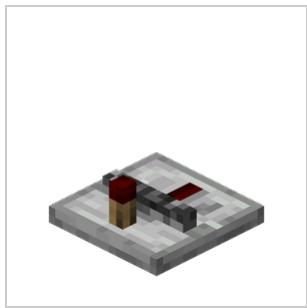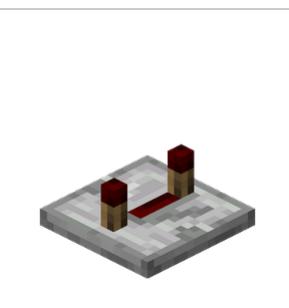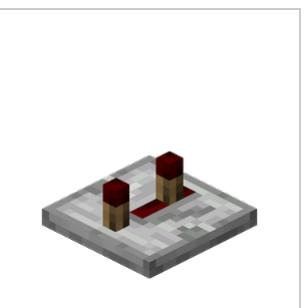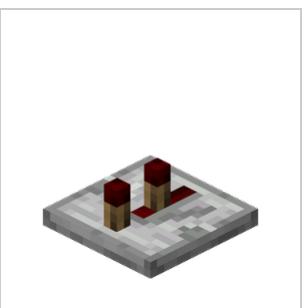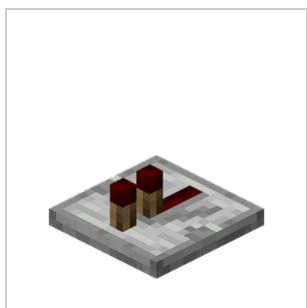
- The crafting recipe and appearance of redstone repeaters may be a reference to double torch repeaters, which was a common way to repeat signals before repeaters were introduced.
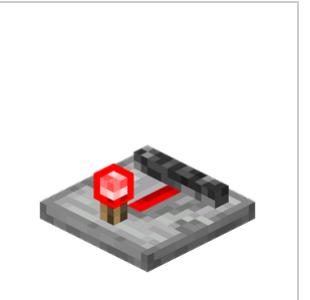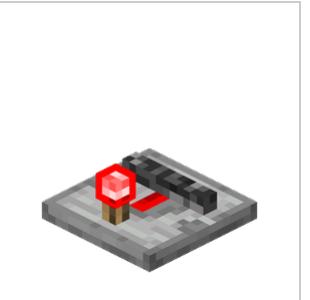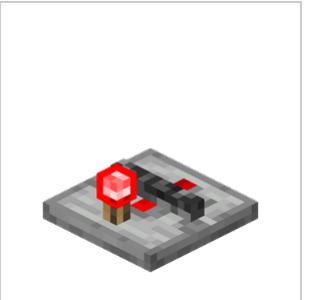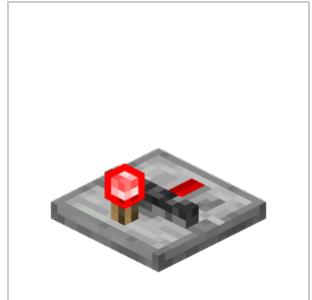
Gallery

## Renders
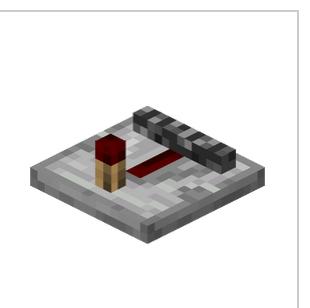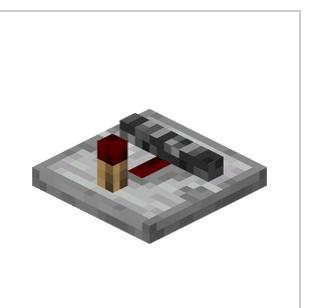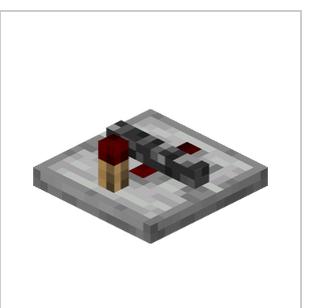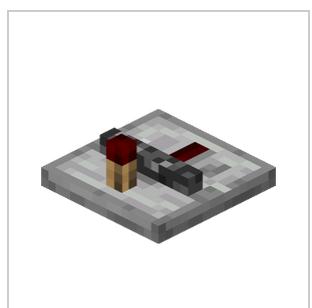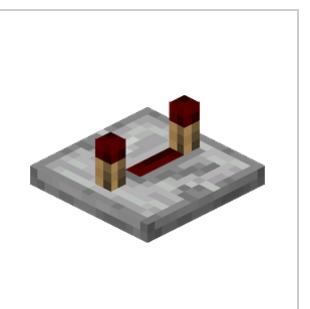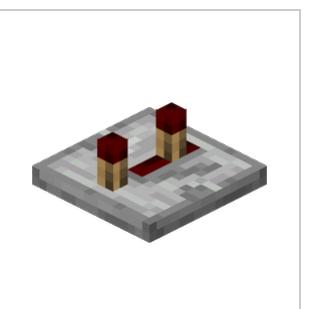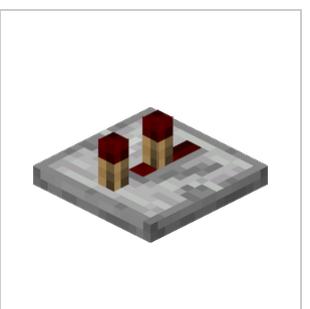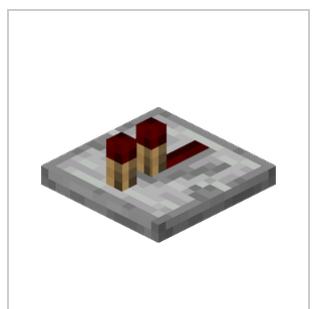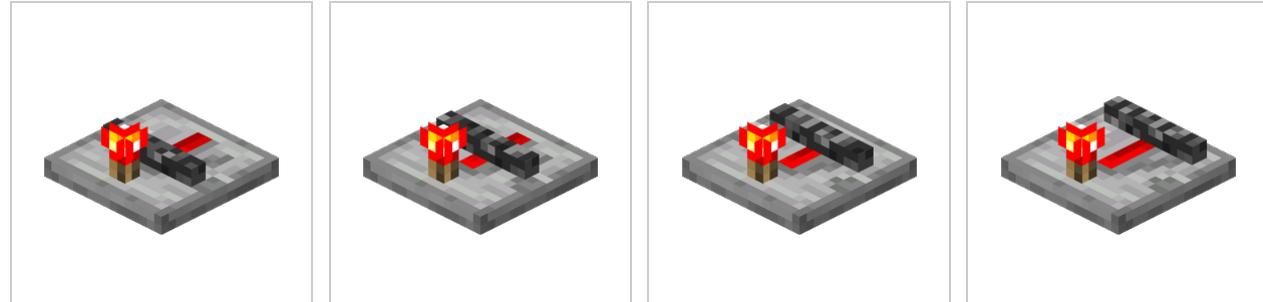
Java Edition
   See also: *Redstone_Repeater/Asset_history*
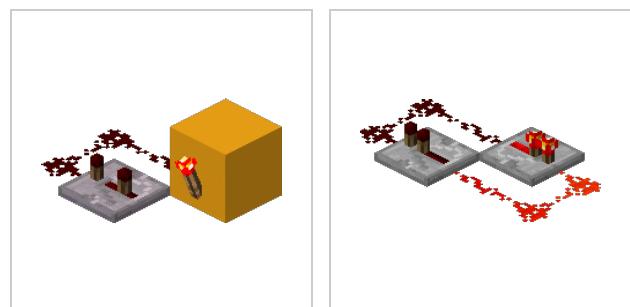
## Bedrock Edition
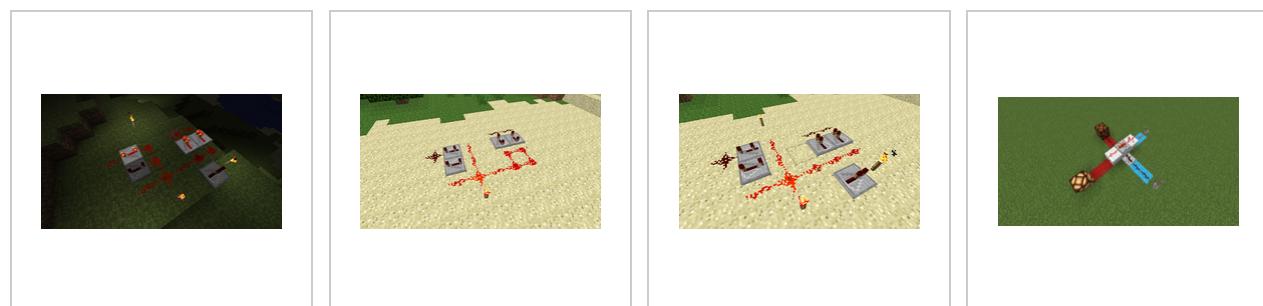
Contraption

A redstone clock formed from a redstone torch and a repeater.
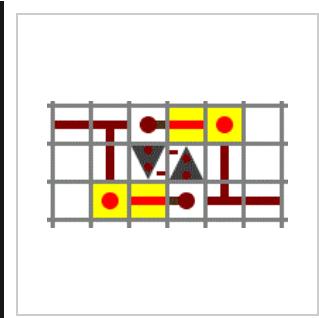
A redstone clock formed from two repeaters.

Screenshots

Crossing redstone wires using repeaters.

In other media

MCRedstoneSim
diagram of a two-way
repeater.

References

1. "@aza1810 You right-click to toggle through 4 possible settings, which currently is 1,2,5 and 7" (https://twitter.com/jeb_/status/33888465502339073) – @jeb_ (https://twitter.com/jeb_) (Jens Bergensten) on X (formerly Twitter), February 5, 2011
2. http://www.reddit.com/r/Minecraft/comments/fmdtp/teammojang_redstone_repeater_video/c1gzrn6
3. MC-50242 — resolved as "Fixed".
4. MC-182820 — resolved as "Fixed".

Navigation

Observer-related	Copper Golem Statue · Decorated Pot · End Portal Frame · Furnace (Blast · Smoker) · Item Frame (Glow) · Respawn Anchor · Shulker Box · Redstone Ore (Deepslate) · Scaffolding · Sculk Catalyst · Sculk Shrieker · Wall
Pistons/related	Piston (Sticky) · Honey Block · Slime Block · Movable and immovable blocks
Sculk sensor-related	Block of Amethyst · Wool (Carpet)
Mechanisms/misc.	Armor Stand · Bell · Big Dripleaf · Copper Bulb · Creaking Heart · Doors (Copper · Iron · Wooden) · Fence Gate · Head · Note Block · Redstone Lamp · Shelf · TNT (Minecart) · Trapdoors (Copper · Iron · Wooden)
Creative or commands only	Command Block (Minecart) · Minecart with Monster Spawner · Structure Block · Test Block

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Interactable	Anvil (Chipped · Damaged) · Barrel · Beacon · Brewing Stand · Cartography Table · Chest (Ender · Copper) · Crafting Table · Enchanting Table · Furnace (Blast · Smoker) · Grindstone · Lectern · Loom · Shulker Box (Dyed) · Sign (Hanging) · Smithing Table · Stonecutter
Utilizable	Banners (Ominous) · Beehive · Beds · Bell · Bookshelf · Cake (with Candle) · Campfire (Soul) · Cauldron · Chiseled Bookshelf · Composter · Conduit · Copper Golem Statue · Decorated Pot · End Gateway · End Portal · End Portal Frame · Farmland · Fletching Table · Flower Pot · Frosted Ice · Heads (Skeleton · Wither Skeleton · Zombie · Creeper · Piglin · Dragon) · Heavy Core · Jukebox · Ladder · Lodestone · Monster Spawner · Nether Portal · Respawn Anchor · Scaffolding · Shelf · Sponge (Wet) · Suspicious Gravel · Suspicious Sand · TNT · Trial Spawner (Ominous) · Vault (Ominous)
Redstone/ Mechanical	Buttons (Wooden · Stone · Polished Blackstone) · Copper Bulb · Crafter · Daylight Detector · Dispenser · Dropper · Doors (Copper · Iron · Wooden) · Honey Block · Hopper · Lever · Lightning Rod · Note Block · Observer · Piston (Sticky) · Pressure Plates (Wooden · Stone · Polished Blackstone · Heavy Weighted · Light Weighted) · Rail (Activator · Detector · Powered) · Redstone Lamp · Redstone Wire (Comparator · Repeater · Torch) · Slime Block · Target · Trapped Chest · Trapdoors (Copper · Iron · Wooden) · Fence Gates · Tripwire Hook (Tripwire)

BE & edu only   Allow Border Chalkboard Compound Creator Deny
Element Constructor Heat Block Item Frame (Glow)
Lab Table Material Reducer Underwater TNT
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