MINECRAFT

REDSTONE ESSENTIALS AND MUST-DO PROJECTS

Dig into Minecraft with this (parent-approved) guide



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Minecraft Redstone Essentials and Must-Do Projects

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Redstone Components

Many types of redstone components other than switches are available. You have plenty of options for your circuitry, from dispensers and hoppers (which help you move and distribute items) to repeaters and comparators (which move the redstone energy within the circuit).

Redstone Repeaters

Redstone repeaters (**Figure 1.19**) are used in a variety of ways: to boost the signal past the first 15 blocks that redstone wire normally can transmit energy, to delay or lock signals, and to control the direction of the signal.

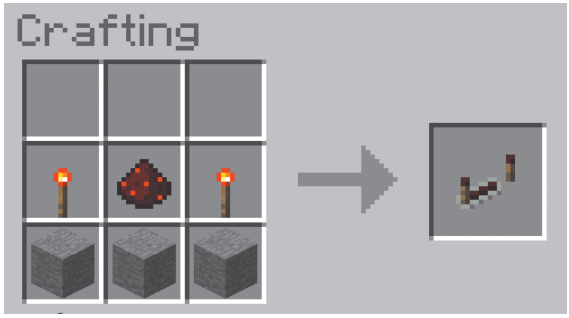

FIGURE 1.19 Redstone repeater recipe: redstone, redstone torch, and stone.

Redstone Comparators

Comparators (**Figure 1.20**) are similar to repeaters but more complex and with more uses. Comparators have two inputs and one output. They can run in one of two modes: subtraction and comparison.

You can use comparators as a measuring tool. They can tell how many items are in a chest or hopper and display the amount by producing energy that represents it (marked by how many blocks the power extends). They can also compare and use energy from both inputs or decrease the amount of energy by subtracting one from the other, depending on the setting.

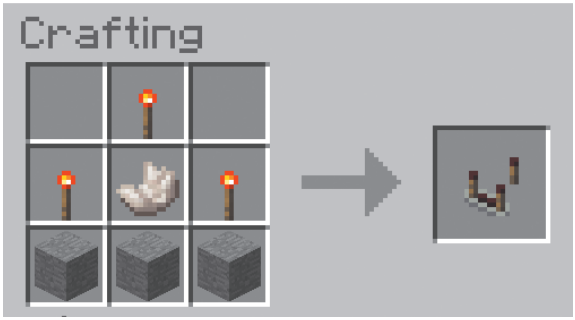

FIGURE 1.20 Comparator recipe: nether quartz, redstone torch, and stone.

Pistons

Pistons (**Figure 1.21**) can push most blocks, but they can't push obsidian, chests, or hoppers. They are activated by redstone and will extend a plate to push an adjacent block. Sticky pistons (**Figure 1.22**) are able to pull a block toward them. Pistons will break items, such as crops, redstone, and tripwires, that are on the ground.



FIGURE 1.21 Piston recipe: wood, cobblestone, iron, and redstone.



FIGURE 1.22 Sticky piston recipe: piston and slime ball.

Droppers

Droppers (**Figure 1.23**) drop items when activated. If you put a container, like a chest, in front of a dropper, it will move items into the chest or container when it's activated.

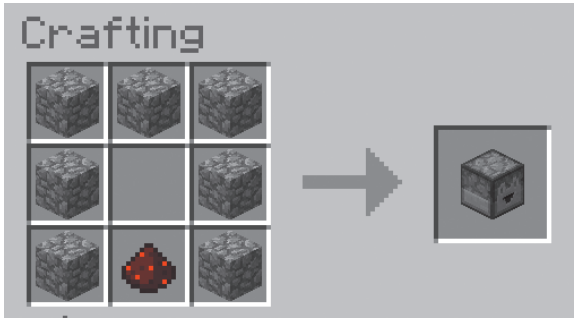

FIGURE 1.23 Dropper recipe: cobblestone and redstone.

Dispensers

Dispensers (**Figure 1.24**) are similar to droppers, but they can shoot objects, such as arrows or fireworks, a good distance. When dispensing other items, the dispenser usually propels them three blocks forward. They don't deposit into containers in the manner that droppers do. They react differently depending upon what they're dropping, such as creating water or lava source blocks from buckets of water or lava, or firing arrows.

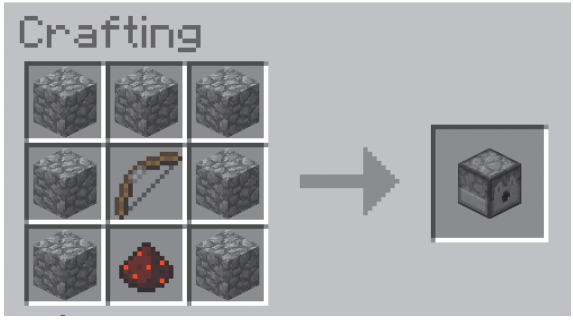

FIGURE 1.24 Dispenser recipe: cobblestone, redstone, and bow.

Hopper

A hopper (**Figure 1.25**) is a funnel-shaped block that also moves items. Items can be collected in a hopper and then automatically moved into chests or other containers. You can use a redstone signal to stop hoppers from dispensing items. Automated systems, such as farms or brewing stands, often use hoppers.

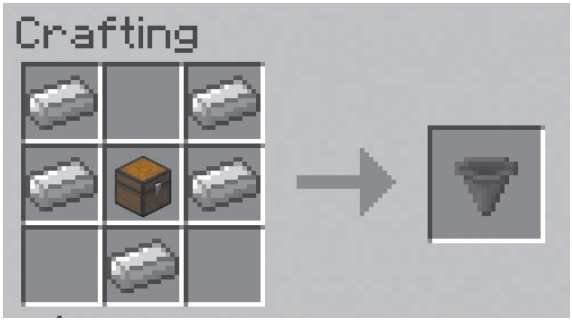

FIGURE 1.25 Hopper recipe: five iron ingots and a chest.

Currents and Circuits

Redstone circuits are not nearly as complicated as electrical circuits can be, but you can still make some pretty amazing devices and machines, especially when you add extras like switches, repeaters, and comparators. Knowing a bit about how currents and circuits work will help you when you're experimenting with redstone.

A *circuit* is the path that electricity or energy runs on between two or more points. We often call this energy the current. With redstone, a circuit includes a power source, such as a torch or lever, and the device it is operating, such as a sticky piston or a door. Redstone does not actually need to be part of the circuit, though it is more often than not. In Chapter 10, you'll find a couple of circuits that don't use any redstone, such as an automated furnace that, using hoppers to move the ores, smelts ores dropped into the top chest and deposits the ingots into the bottom chest (**Figure 1.26**).

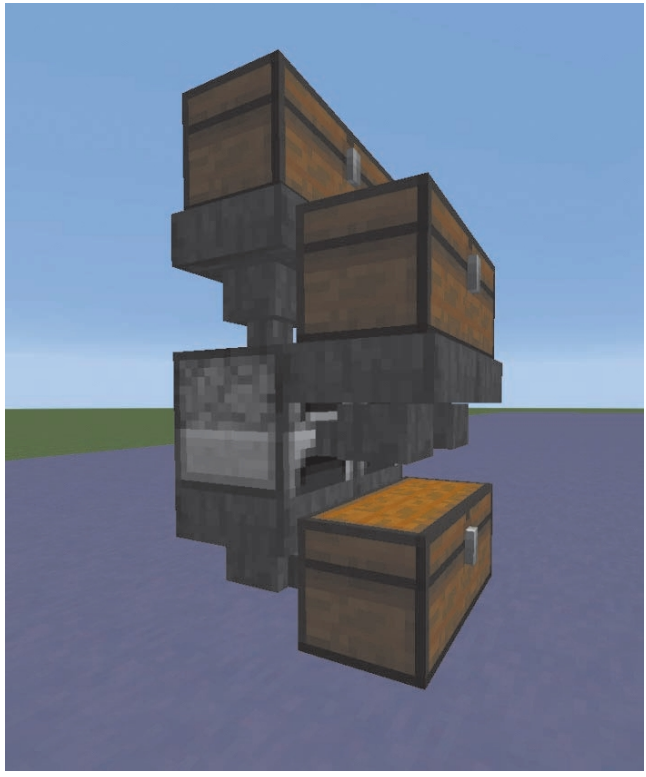

FIGURE 1.26 This automated furnace doesn't use redstone but is still an example of a circuit.

All circuits, whether they are electrical or redstone, need two things: a power source and a connected circuit. Without power, there is no current and nothing will happen, just like when the power goes out in your house. If you don't have power, your redstone won't work.

Minecraft power sources can be redstone torches or redstone blocks, but switches such as buttons or levers are also power sources. This is different from electricity, where switches are used only to turn power on and off and are not the source of the power itself.

A circuit is a combination of a power source, wires, and components such as switches. All the parts of a circuit need to be connected to each other—there can't be places where the power doesn't flow from one part of the circuit to

the next. The wires need to be connected to the power source and to the device that is being powered, as well as to any switches.

A real-life example of this is using a battery to light up a light bulb. Maybe you've done this science experiment yourself (and maybe you've even tried it with a lemon or potato instead of a battery!). To make a closed circuit, we connect two wires to the two ends of the battery. Without something for the wires to connect to, there isn't a circuit, but if we attach those ends to a light bulb, the power can flow from the battery to the bulb and back to the battery, making a circuit.

Redstone circuits are a little different—we can send the power from the source, such as a redstone torch, to the device we want to power, like a redstone lamp, without using a second wire to go back to the torch or even having a wire. A redstone circuit can be as simple as placing a lever on a redstone lamp (**Figure 1.27**). Once we start to add other parts, the circuit can become much more complex.



FIGURE 1.27 A redstone lamp can be powered on and off by a lever attached directly to it.

Power On, Power Off

With all circuits, power is either on or off. There is no in-between. In Minecraft, we usually say that redstone is powered (on) or unpowered (off).