

What is a Raspberry Pi?

Raspberry Pi is the name of a series of single-board computers made by the Raspberry Pi Foundation, a UK charity that aims to educate people in computing and create easier access to computing education.

The Raspberry Pi launched in 2012 (twenty twelve), and there have been several iterations and variations released since then. The original Pi had a single-core 700MHz (Megahertz) CPU (CiPiU) and just 256MB RAM (MegaBajts RAM), and the latest model has a quad-core CPU (CiPiU) clocking in at over 1.5GHz (One and Half GigaHertz), and 4GB RAM (GigaBajtz RAM). The price point for Raspberry Pi has always been under \$100 (usually around \$35 USD), most notably the Pi Zero, which costs just \$5.

All over the world, people use the Raspberry Pi to learn programming skills, build hardware projects, do home automation, implement Kubernetes clusters and Edge computing, and even use them in industrial applications.

The Raspberry Pi is a very cheap computer that runs Linux, but it also provides a set of GPIO (general purpose input/output) pins, allowing you to control electronic components for physical computing and explore the Internet of Things (IoT).

What Raspberry Pi models have been released?

There have been many generations of the Raspberry Pi line: from Pi 1 to 4, and even a Pi 400. There has generally been a Model A and a Model B of most generations. Model A has been a less expensive variant, and tends to have reduced RAM and fewer ports (such as USB and Ethernet). The Pi Zero is a spinoff of the original (Pi 1) generation, made even smaller and cheaper.

What's the Raspberry Pi Foundation?

The Raspberry Pi Foundation works to put the power of computing and digital making into the hands of people all over the world. It does this by providing low-cost, high-performance computers that people use to learn, solve problems, and have fun. It provides outreach and education to help more people access computing and digital making—it develops free resources to help people learn about computing and making things with computers and also trains educators who can guide other people to learn.

Code Club and CoderDojo are part of the Raspberry Pi Foundation, although these programs are platform-independent (they're not tied to Raspberry Pi hardware). The Raspberry Pi

Foundation promotes these clubs and helps grow the network around the world in order to ensure every child has access to learning about computing. Similarly, Raspberry Jams are Raspberry Pi-focused events for people of all ages to come together to learn about Raspberry Pi and share ideas and projects.

What can you do with a Raspberry Pi?

Some people buy a Raspberry Pi to learn to code, and people who can already code use the Pi to learn to code electronics for physical projects. The Raspberry Pi can open opportunities for you to create your own home automation projects, which is popular among people in the open source community because it puts you in control, rather than using a proprietary closed system.

What You Need to Get Started

The Raspberry Pi is the heart of your project, but a single circuit board isn't going to go very far without a power supply or storage. To get your project up and running you'll need a few things:

A Power Supply

Previous versions of the Pi use microUSB for power delivery, but the Raspberry Pi 4 upgrades to USB-C (albeit an out-of-spec version). While certain phone chargers might power the Pi just fine, I recommend buying a power adapter designed for the Pi like this one from CanaKit or the official models from the Raspberry Pi Foundation. The USB chargers you have lying around might not provide consistent enough power to the board, and the less you have to troubleshoot, the better.

A microSD Card

Most newer Pi models use microSD cards for storage, with the original Pi model A and B using a regular SD card. Not all SD cards work perfectly, though, so your best bet is to either buy the official Raspberry Pi microSD card. You'll also need a way to plug the SD card into your computer, like this USB adapter.

A Case

Technically, this is optional but i recommend it. Instead of having your bare board out in the open, it's probably a good idea to protect it with a case. Pi 4 cases are still coming to market, but for earlier models, the FLIRC case is a particularly great option thanks to its built-in heatsink.

Of course, there are other cool cases out there, like retro gaming cases and transparent cases that show off the hardware inside. Many cases also come with separate heatsinks and/or fans, which can aid in keeping that system-on-a-chip running cool.

Mouse, Keyboard, and HDMI Cable

Depending on your project, you may not need a mouse and keyboard permanently attached to your Pi, but you'll probably want them on hand for the initial setup. If it's too much of a hassle to remove the mouse and keyboard from your main computer and do the same for your HDMI cable (or micro-HDMI cable, if you're using the Pi 4).

You can make your life simple and buy all these accessories together in the official Pi 4 kit or this Pi 3 kit from CanaKit, but if you prefer to buy it piecemeal, you might be able to save some money if you already have several accessories lying around.

In addition, you'll also need whatever other components are required for the specific project at hand—if you're building a retro gaming machine, for example, you'll want some USB gamepads along with everything else.