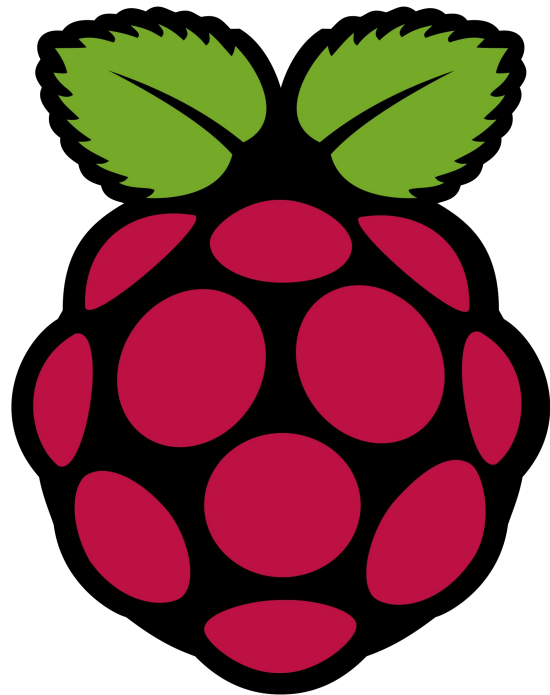# Introduction to Raspberry Pi

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What is Raspberry Pi?

- A series of small single-board computers (SBCs).

- Complete computer built on a single circuit board, typically with microprocessor, memory, USB and display ports, and wireless LAN and Bluetooth connectivity.

- Programmable hardware, can be programmed or customized to perform specific tasks or functions.

- Designed and developed by Raspberry Pi Foundation, primarily to create easier access to computing education. Also commonly used in academic research and commercial production processes and products.

- Made in Wales, UK.

History

The idea of Raspberry Pi came in 2006 as Eben Upton was working on a single board computer project inspired by the BBC Micro.

Observing a decline in the numbers and skills of students applying for computer science class, and attributing this to the high cost of programmable computers, Upton and his colleagues at Cambridge decided to develop an affordable computer on which children could learn to program.

After 6 years of development, the first Raspberry Pi was released in February 2012 at c.£20 in the UK.

Demand for the basic computer was first driven by hobbyists and makers, but educational institutions and the industrial sector soon followed, and Raspberry Pi became the best-selling British computer of all time in 2015.

By its 10th anniversary in 2022, more than 40 million units had been sold world-wide.

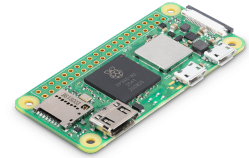**Story of Raspberry Pi**: https://www.youtube.com/watch?v=UCt6d0SCxO4
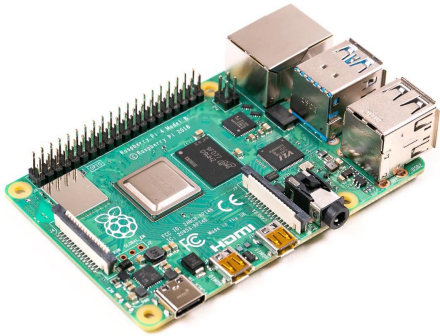
Flavours

Raspberry Pi
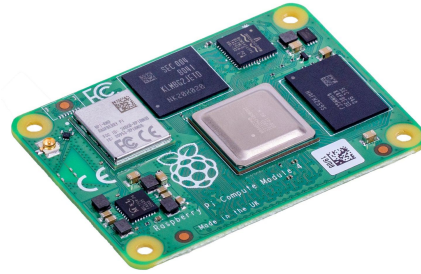B+/2B/3B/3A+/3B+/4B/5

Raspberry Pi 400

Raspberry Pi Zero
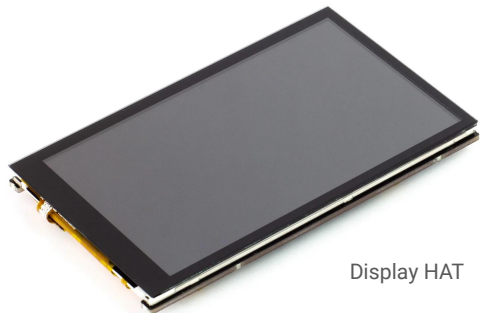W/WH/2W

More flavours

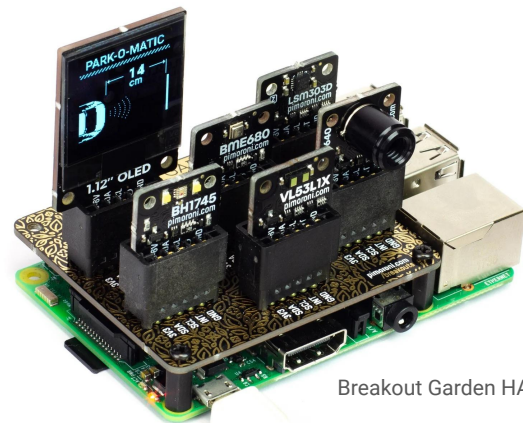
Raspberry Pi Pico

Raspberry Pi
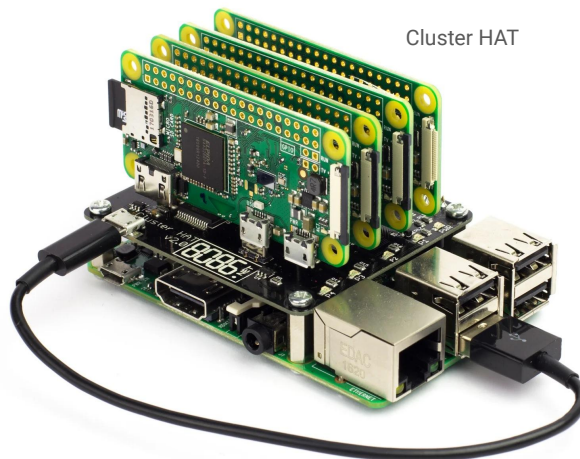Compute Module

HATs, pHATs & GPIO

Pan-Tilt HAT

Display HAT

Breakout Garden HAT

Cluster HAT

3D Tracking & Gesture HAT

Compact size

- The board itself is a credit card size or smaller and thus compact, but at the very minimum, it requires power supply.

- You will also need another computer to flash the OS, although this is temporarily and can be one-off.

- Depending on what you want to build with, and how you want to use, Raspberry Pi, you may need display monitor, keyboard, mouse, external drive, breadboard, jumper cables, case, etc.

Affordability

- £20–80 for a board, plus £10–12 power supply unit.

- £40–150 for a kit containing Raspberry Pi, power supply unit and case.

- The cost of basic peripherals like display monitor, keyboard and mouse, as well as USB and HDMI cables need to be taken into account.

- However, does not require proprietary peripherals and re-using existing monitor, keyboard and mouse (including CRT monitor and television) can help keep the cost down.

Low power consumption

- Raspberry Pi 4 draws about 2.47W at idle and 6.79W at CPU Max. Surface Pro draws about 5W at idle and 15W at CPU Max. iMac (such as the one in Makerspace - 27inch 2020 model) draws about 74W at idle and 295W at CPU Max.

- WiFi, Bluetooth, peripherals connected via USB and HDMI ports, like display monitor, external drives, webcams, and via GPIO pins like HATs, all consume energy.

- So do software, particularly Graphical User Interface, including Desktop.

- The System-on-Chip (SoC) remains powered by default even when shutdown completely and until disconnected from the power source. e.g. when shutdown, Raspberry Pi 4 still consumes around 1.0-1.2W, which is quite high considering Surface Pro consumes only around 0.2-0.5W.

- However, with Raspberry Pi, you have far more control over your energy consumption than laptop or desktop computers.

Open source

- The Raspberry Pi's design and schematics are not entirely open-source.

- While the software running on Raspberry Pi is open source (like Linux distributions), the hardware, especially the Broadcom chip, is proprietary.

- Worth noting that Raspberry Pi Foundation has never claimed that Raspberry Pi is open source hardware; rather, it has always maintained that the engineering focus on Raspberry Pi is on cost and education, not on being openness.

Uses in Digital Humanities

- Exhibitions, poster sessions e.g. project demos, kiosk display, etc.

- Learning/teaching digital skills e.g. command line, Python, Regular Expressions, system administrations, operating systems and networks, etc.

- Sandbox environment for experimentations e.g. software engineering, website and visualisations development, etc.

- Data collection and processing e.g. scraping, cleaning, transformations, etc.

- Reproduction e.g. emulation, instances of old software, database, etc.

- Deploy Local LLMs for inference, Machine Learning.

Links

Documentation

- [Getting Started with Raspberry Pi](#)
- [Raspberry Pi documentation](#)

Project ideas and tutorials

- [Raspberry Pi Foundation Learning Resources](#)
- [Raspberry Pi Foundation Project Selector](#) (70+ projects)
- [PiMyLifeUp](#) (160+ projects)