# What Is Arduino?

Arduino is really a collection of things. Before we talk about what makes it special, lets just look at what it actually is.

First off, Arduino is a **microcontroller development board**.. A w-w-what?

Well, you may have heard that these days everything  - fridges, toasters, cars, phones, TVs - have "microchips" in them. To use the correct terminology, most of these use **microcontrollers**

A microcontroller is a bit like the processor in your laptop, but it has a couple of differences;

- Most microcontrollers are quite simple and low-powered compared to the processor in a personal computer, they are designed to be set one specific task to do (like making your toast come out just the right shade of brown) and to do it with the minimum of fuss.

- Most microcontrollers are self contained - they have memory and storage built in and they are all ready to talk to the outside work without lots of fussy interfaces

Microcontrollers are everywhere. They are cheap, useful and reliable. There are thousands of manufacturers and types of them!

**They should also be great fun for everybody to play with! Just think of the crazy things you could do with one.**

However, before Arduino (and similar educational projects like PicAXE and Basic STAMP) most microcontrollers were confined to industry. Although the chips were cheap, the tools you needed to work with them were not, and they were not really very friendly or accessible for the average hobbyist or student.

The Arduino project sought to change that, it was a project started ten years ago by a team of Italian university students and has been through several different stages since then, with the hardware getting better over time.

However the best thing about Arduino, and the real key to it's success is:

- **The project is open source**. All the design is openly documented and you can make and sell your own versions of it. This has brough the prices down, making Arduino programming affordable to everyone.

- **The development tools are free**. You can download them and use them for nothing!

- A **huge global community** has grown up around it. There are web forums, sample code, tutorials online. There are alots of add-ons available from many manufacturers.

Otherwise there is really nothing special about the hardware chosen by the Arduino project. The current "mainstream" board (the Uno) uses a middle of the range 8-bit microcontroller from Atmel called the Atmega328. This has 32k of Flash memory and 2k of RAM. This is maybe a million times less than your laptop! But there is beauty in simplicity!

Arduinos are often used in education, robotics, art and music and even for industrial prototyping. Their wide support makes them a great choice for the hobbyist and as a way in to the wonderful world of microcontroller programming and electronics in general.

Other manufacturers have taken note and there are now many similar cheap development boards for other microcontrollers. Some even have the same connectors as the Arduino so the same add-ons can be used.

There are also cheap new "single board computers" like the Raspberry Pi. These are much more like a laptop than an Arduino and are really quite different to work with. They are many times more powerful, but also much more complicated to work with.