An Illustrated History of Computers

A very old abacus

A more modern abacus. Note how the abacus is really just a representation of the human fingers: the 5 lower rings on each rod represent the 5 fingers and the 2 upper rings represent the 2 hands.

A slide rule

A more modern set of Napier's Bones

An original set of Napier's Bones

Pascal's Pascaline
A Pascaline opened up so you can observe the gears and cylinders which rotated to display the numerical result.

Leibniz's Stepped Reckoner

Jacquard's Loom showing the threads and the punched cards.

By selecting particular cards for Jacquard's loom you defined the woven pattern.

A close-up of a Jacquard card.

A small section of the type of mechanism employed in Babbage's Difference Engine.
The Analytical Engine

An operator working at a Hollerith Desk like the one below

Preparation of punched cards for the U.S. census

A few Hollerith desks still exist today

Two types of computer punch cards

The Harvard Mark I: an electro-mechanical computer
One of the four paper tape readers on the Harvard Mark I (you can observe the punched paper roll emerging from the bottom).

The first computer bug

Two views of Colossus of Great Britain

The First Generation (1951-1958)
- Vacuum tubes as their main logic elements.
- Punch cards to input and externally store data

Two views of ENSAC: the "Electronic Numerical Integrator and Calculator" (note that it wasn't even given the name of computer since "computers" were people)
HAL from the movie "2001: A Space Odyssey". Look at the previous picture to understand why the movie makers in 1968 assumed computers of the future would be things you walk into.

Reprogramming ENIAC involved a hike.

Three views of paper tape.
The Second Generation (1958-1963)
- Vacuum tubes replaced by transistors as main logic element.
- AT&T's Bell Laboratories, in the 1940s
- Crystalline mineral materials called semiconductors could be used in the design of a device called a transistor
- Magnetic tape and disks began to replace punched cards as external storage devices.

The Third Generation (1964-1979)
- Individual transistors were replaced by integrated circuits.
- Magnetic tape and disks completely replace punch cards as external storage devices.

The microelectronics revolution is what allowed the amount of hand-crafted wiring seen in the prior photo to be mass-produced as an integrated circuit which is a small sliver of silicon the size of your thumbnail.

An IBM Stretch computer of 1959

that's just the operator's console, here's the rest of its 33 foot length

An IBM Key Punch machine which operates like a typewriter except it produces punched cards rather than a printed sheet of paper
The Fourth Generation (1979 - Present):
- Large-scale and very large-scale integrated circuits (LSIs and VLSIs)
- Microprocessors that contained memory, logic, and control circuits (an entire CPU)
- Central Processing Unit on a single chip.
- Which allowed for home-use personal computers or PCs, like the Apple (II and Mac) and IBM PC.

The original IBM Personal Computer

The Altair 8800, the first PC

The Apple 1 which was sold as a do-it-yourself kit (without the lovely case seen here)

Apple's GUI (on the first Mac) debuts in 1984

First...

...powerbook

...pad

...phone

...iTunes
Vacuum tubes as their main logic elements.
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