



The Semiconductor Revolution

Billions of tiny switches that run the modern world

From one switch to billions

Year	Milestone
1947	Transistor invented at Bell Labs
1958-59	First integrated circuits, by Kilby and Noyce
1965	Moore's law: transistor counts double about every two years
1971	Intel 4004: about 2,300 transistors
Today	Top chips: tens to hundreds of billions

A modern transistor is a few dozen atoms wide in places.

How a chip is made

1

Purify silicon

Grown into a large crystal and sliced into wafers

2

Print patterns with light

Lithography draws circuits smaller than a virus

3

Add and etch layers

Dozens of layers of wiring and switches

4

Test and package

Each wafer becomes hundreds of chips

A transistor

An electrical switch with no moving parts: on is 1, off is 0.

Where chips are



Phones and computers

Processors and memory



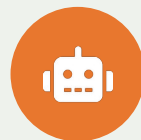
Cars

Dozens to thousands of chips per vehicle



Medicine

Scanners, monitors and pacemakers



AI

Specialized chips train and run models

Sources: Computer History Museum; Semiconductor Industry Association

Remember

Every digital device is built on transistors, tiny switches made by the billions on silicon.