

## Major Inventions in Physics

At the Paimio Electrical Museum, visitors can explore some of the most important inventions in physics through a series of illustrated information panels. The panels not only introduce the museum's main themes but also provide concise accounts of the history of significant inventions in physics.

Among these inventions, the automobile, the dynamo, the camera, the telegraph, the aeroplane, the telephone, the radio, electric lighting, television and the computer have revolutionised our everyday lives in many ways. They have also contributed to the development of important new inventions and to the advancement of electrical engineering.



The history of transportation includes the automobile, the aeroplane and the hot-air balloon. Of these inventions, the hot-air balloon was the earliest, making its debut in 1783. The first passengers to travel by hot-air balloon were a sheep, a rooster and a duck.

The successful experiment and the balloon flight over Paris demonstrated that air travel was indeed possible. However, the first aeroplane did not take to the skies until 1903. Powered by an internal combustion engine, its maiden flight lasted 12 seconds.

The automobile followed soon after the invention of the hot-air balloon. The French engineer Joseph Cugnot developed a steam-powered vehicle driven by a steam boiler. Steam was compressed to high pressure by means of a valve, and this pressure drove a system of gears that turned the wheels of the three-wheeled vehicle. However, the steam pressure was sufficient to propel the vehicle forward for only about fifteen minutes.

A hundred years later, two other French inventors further increased the pressure generated by the vehicle and succeeded in raising its speed to as much as 40 kilometres per hour. In 1889, the internal combustion engine was developed, providing the basis for the engines that still power many cars today.



Electric lighting, radio, the telephone, the computer, television and the telegraph transformed many of our everyday means of communication. Among these inventions, the telegraph, whose transmitted messages were known as telegrams, was particularly significant, as it laid the foundation for the development of all modern communication technologies.

The first electric telegraph was invented by Samuel Morse in 1837. It was capable of transmitting 25 words per minute using combinations of short and long signals. In 1879, Alexander Graham Bell discovered that electric current could also be converted into speech. This led to the invention of the first telephone.

The earliest computers served a very different purpose from those of today. The first computer was developed from the need to create a calculating machine. In 1946, the first computer performed 5,000 calculations per second and required a room measuring 160 square metres. Only twenty years later, a silicon microchip no larger than a flea integrated both a powerful calculator and memory. It was capable of performing 50 million additions per second.



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Within just a few decades, technology has advanced by enormous leaps. By understanding the original operating principles of these devices, it becomes easier to appreciate the path of development that has led to the present day—and, in turn, to devise even better solutions, for example from the perspective of environmental sustainability.