

Advanced Topic:
A Brief History: The Edisonian Approach

Edison said, "When I want to discover something, I begin by reading up everything that has been done along that line in the past - that's what all these books in the library are for. I see what has been accomplished at great labor and expense in the past. I gather data of many thousands of experiments as a starting point, and then I make thousands more." This "Edisonian" approach to research and development is the basis for much of today's progress in science and technology.

Prior to Edison's work on the light bulb, most of the lamps had thick filaments with relatively low resistance and operated in a series circuit. These circuits operated at high currents and low voltages. Edison realized that in inventing an electric light usable for the masses, he had to consider the entire system, including lights, generators and transmission lines. This led him to the insight that the light bulbs must be arranged in parallel circuits so that lights could be individually turned on and off, much as gas jets could be turned on and off for the gas lighting that was common in the 1880's. He also came to realize that the light bulb must have a high resistance, use very little current and operate at a relatively high voltage. The low current bulb he invented greatly reduced the amount of (at the time) costly copper needed for the transmission lines (by a factor of about 100), compared to the low resistance bulbs proposed and being worked on by others.

Edison's most famous light bulb patent is attached as appendix 1.

This unit provides a natural tie-in to studies in economics and US history that involve the electrification of society, the industrial revolution, the rivalry between AC and DC distribution systems and the growth of industrial research laboratories.