

caused or contributed to, the innovation of interest. It is critical for students to read about the time period first. The development of barbed wire does not make sense unless it is first situated in the cattle industry and grazing rights. The impact of the vacuum cleaner is only understood when juxtaposed with the changing roles for women in the 20th century. Without historical context it is impossible for students to analyze the impact of an innovation.

Perhaps it was an answer to a problem. For example, the New Deal could be seen as the United States' response to the Great Depression of the 1930s. Or maybe the innovation built on other recent developments, with creative individuals taking advantage of opportunities rather than setting out to solve a problem. Thomas Edison's discovery of ways to understand and harness electricity, for example, made all sorts of further inventions possible: electric lights, automobiles, and labor saving devices for the kitchen, just to name a few. Other innovators built on Edison's work to develop new systems to distribute electricity from a central utility company to individuals' homes and businesses. Innovation in government roles, regulation, and policy also took place,

as distribution of electricity became increasingly perceived as a public service — most likely to solve problems as well as take advantage of the new technological innovations.

The other aspect of the "in history" part of the theme is to look at the effects or results of the innovation. How did people react initially, in the short term (within a few years), and over the longer term (in later years and decades), to the new idea, arrangement, organization, or technology? The short term is the impact of the innovation and the long term is the change over time brought about by the innovation. What were the personal ramifications for the innovator? How soon did people adopt or accept the innovation — or did they reject it? What happened to the ideas or items replaced by the innovation, and how quickly did those trends show up? How did it change people's ideas, scientific knowledge, everyday behavior, political processes, etc.? Did the innovation just influence people locally, or did its influences extend nationally or to other countries, and in what ways did the influences appear? Has the innovation been supplanted by other innovations, and how fast did that replacement process occur? All of these questions are designed to explore the historical significance of the topic.

### Sample Topics to Consider

Gunpowder: Revolutionizing War

The Camera: Bringing the World into Focus

The Cotton Gin: Increased Production

The Vacuum Cleaner: Redefining Roles

The Sewing Machine: Joining the Industry

The Telephone: Call me! Increased Communication

Plastic: The Gift that Won't Go Away

Refrigeration: Going Cold

Water-drive Mechanical Clock (1061 Peking): Measuring Time

Windmills: New Labor Source

Panama Canal: Connections

Erie Canal: Transforming and Transporting

Penicillin: Saving Lives

The Double Helix: Connecting the Dots

Polio Vaccine: Breakthrough

Atomic Energy: Harnessing the Atom