Section 1

The Rise of Industry

Guide to Reading

Big Ideas

Government and Society The United States government adopted a policy of laissez-faire economics, allowing business to expand.

Content Vocabulary

- gross national product *(p. 410)*
- laissez-faire *(p. 414)*
- entrepreneur *(p. 415)*

Academic Vocabulary

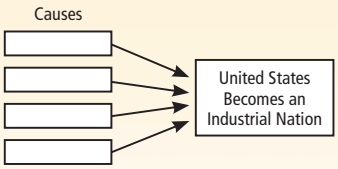
- resource *(p. 410)*
- practice *(p. 415)*

People and Events to Identify

- Edwin Drake *(p. 410)*
- Alexander Graham Bell *(p. 412)*
- Thomas Alva Edison *(p. 412)*
- Morrill Tariff *(p. 415)*

Reading Strategy

Organizing As you read about the changes brought about by industrialization, complete a graphic organizer similar to the one below, listing the causes of industrialization.



American business and industry grew rapidly after the end of the Civil War. Industrialization changed the way people lived and worked.

The United States Industrializes

MAIN Idea Natural resources and a large labor force allowed the United States to industrialize rapidly.

HISTORY AND YOU What natural resources are located in your area? Read to learn how the availability of raw materials encouraged industrialization.

Although the Industrial Revolution began in the United States in the early 1800s, most Americans still lived on farms. Out of a population of over 30 million, only 1.3 million Americans worked in industry when the Civil War began in 1861. After the war, industry rapidly expanded, and millions of Americans left their farms to work in mines and factories. Factories began to replace smaller workshops as complex machinery began to substitute for simpler hand tools.

By the late 1800s, the United States was the world's leading industrial nation. By 1914 the nation's **gross national product** (GNP)—the total value of all goods and services that a country produces—was eight times greater than it had been in 1865 when the Civil War came to an end.

Natural Resources

An abundance of raw materials was one reason for the nation's industrial success. The United States had vast natural **resources,** including timber, coal, iron, and copper. This meant that American companies could obtain them cheaply and did not have to import them from other countries. Many of these resources were located in the American West. The settlement of this region helped accelerate industrialization, as did the transcontinental railroad. Railroads took settlers and miners to the region and carried resources back to factories in the East.

At the same time, people began using a new resource, petroleum. Even before the automotive age, petroleum was in high demand because it could be turned into kerosene. The American oil industry was built on the demand for kerosene, a fuel used in lanterns and stoves. The industry began in western Pennsylvania, where residents had long noticed oil bubbling to the surface of area springs and streams. In 1859 **Edwin Drake** drilled the first oil well near Titusville, Pennsylvania. By 1900 oil fields from Pennsylvania to Texas had been drilled. As oil production rose, it led to economic expansion.

A Large Workforce

The human resources available to American industry were as important as natural resources in enabling the nation to industrialize rapidly. Between 1860 and 1910 the population of the United States nearly tripled. This population growth provided industry with an abundant workforce and also created greater demand for the consumer goods manufactured by factories.

Population growth stemmed from two causes—large families and a flood of immigrants. Because of better living conditions, more children survived and grew to adulthood. American industry began to grow at a time when social and economic conditions in eastern Europe and China convinced many people to immigrate to the United States in search of a better life. Many were also seeking to escape oppressive governments and religious persecution. Between 1870 and 1910, more than 17 million immigrants arrived in the United States. These multitudes entered the growing industrial workforce, helped factories increase production, and became consumers of industrial products.

Reading Check **Explaining** How did oil production affect the American economy?

New Inventions

MAIN Idea During the late 1800s, inventions such as the telephone and the lightbulb spurred economic development.

HISTORY AND YOU What invention has most changed your daily life? Read about the new inventions of the late 1800s.

Natural resources and labor were essential to America's economic development, but new inventions and technology were important as well. New technology increased the nation's productivity and improved transportation and communications networks. New inventions also resulted in new industries, which in turn produced more wealth and jobs.

Bell and the Telephone

In 1874 a Scottish immigrant named **Alexander Graham Bell** suggested the idea of a telephone to his assistant, Thomas Watson. Watson recalled, "He had an idea by which he believed it would be possible to talk by telegraph." Bell began experimenting with ways to transmit sound via an electrical current of varying intensity. In 1876 he succeeded. Picking up the crude telephone, he placed a call to the next room, saying, "Come here, Watson, I want you." Watson heard and came. The telephone revolutionized business and personal communication. In 1877 Bell organized the Bell Telephone Company, which eventually became the American Telephone and Telegraph Company (AT&T).

Edison, Westinghouse, and Electricity

Perhaps the leading pioneer in new technology was **Thomas Alva Edison.** Curious about the world from an early age, he learned all he could about the mechanical workings of objects. His laboratory at Menlo Park, New Jersey, was the forerunner of the modern research laboratory. Edison set up his lab with money he earned by improving the telegraph system for Western Union. He referred to it as an "invention factory." During the first five years Menlo Park existed, Edison patented an invention almost every

American Inventions, 1865–1895

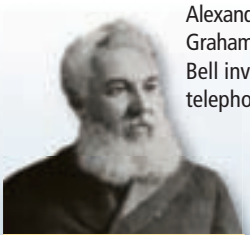
1870

1872 Elijah McCoy invents automatic lubricator for steam engines, allowing trains to run faster with less maintenance

1873 Christopher Sholes develops typewriter and sells it to Remington and Sons

1875

1876 Alexander Graham Bell invents telephone



▲ *Alexander Graham Bell*

1877 Thomas Edison develops phonograph

▲ *Early Edison phonograph*

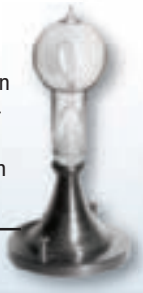
1880

▲ *Bell's first telephone*

1882 Lewis Latimer invents the carbon filament for lightbulbs, allowing them to last much longer

1885

1886 Josephine Cochrane develops automatic dishwasher; its basic design is still used today



▲ *Edison's first commercial lightbulb*

month. By the time he died, Edison held more than one thousand patents.

Edison first achieved international fame in 1877 with the invention of the phonograph. Two years later he perfected the electric generator and the lightbulb. Although Edison had expected to produce an inexpensive lightbulb in six weeks, the task took more than a year. His laboratory then went on to invent or improve several other major devices, including the battery, the dictaphone, and the motion picture.

An Edison company began to transform American society in 1882 when it started supplying electric power to New York City. In 1889 several Edison companies merged to form the Edison General Electric Company (today known as GE).

Engineer and industrialist George Westinghouse invented an air-brake system for railroads. Unlike earlier manual systems that required brakes to be applied to each car, Westinghouse's invention provided a continuous braking system, so that all the cars' brakes were applied at the same time. Because the trains could brake rapidly and smoothly, they could safely travel at higher speeds.

Westinghouse also developed an alternating current (AC) system to distribute electricity using transformers and generators. Working with inventor Nikola Tesla, Westinghouse further improved his system. His Westinghouse Electric Company lit Chicago's Columbia Exhibition in 1893. It was also the first to use the hydroelectric power of Niagara Falls to generate electricity for streetcars and lights in Buffalo, New York, 22 miles away.

Technology's Impact

In ways big and small, technology changed the way people lived. Shortly after the Civil War, Thaddeus Lowe invented the ice machine, the basis of the refrigerator. In the early 1870s Gustavus Swift, founder of Swift Meatpacking, hired an engineer to develop a refrigerated railroad car. Swift shipped the first refrigerated load of fresh meat in 1877. The widespread use of refrigeration kept food fresh longer and reduced the risk of food poisoning.

1893
Charles and Frank Duryea invent gasoline-powered automobile

▲ *The Wright Flyer lifts off, December 17, 1903.*

1903
Wilbur and Orville Wright make first successful powered flight at Kitty Hawk, North Carolina

1890 1895 1900 1905

1888
George Eastman patents first hand-held camera, the Kodak

Analyzing TIME LINES

1. **Sequencing** Did the invention of the phonograph occur before or after the invention of the typewriter?
2. **Calculating** How much time elapsed between the invention of a gasoline-powered automobile and the first flight of the Wright brothers?
3. **Identifying** For what invention is Josephine Cochrane known?

The textile industry had long depended on machines to turn fibers into cloth. By the mid-1800s, the introduction of the Northrop automatic loom allowed cloth to be made at a much faster rate. Bobbins, which had to be changed by hand, could now be changed automatically.

Changes also took place in the clothing industry. Standard sizes were used in making ready-made clothes. Power-driven sewing machines and cloth cutters rapidly moved the clothing business from small tailor shops to large factories. Similar changes took place in shoemaking. By 1900 cobblers had nearly disappeared.

Technology's impact also included improved communications. Cyrus Field laid a telegraph cable across the Atlantic Ocean in 1866. This cable provided instant contact between the United States and Europe.

Reading Check **Explaining** How did the use of electric power affect economic development?

Free Enterprise

MAIN Idea Laissez-faire economics promoted industrialization, but tariffs protected American companies from competition.

HISTORY AND YOU Do you remember how Americans objected to British taxes on trade before the American Revolution? Read how tariffs affected American industries in the late 1800s.

Another important reason the United States was able to industrialize rapidly was its free enterprise system. In the late 1800s, many Americans embraced the idea of **laissez-faire** (leh•say•FARE), a French phrase meaning "let people do as they choose." Supporters of laissez-faire believe the government should not interfere in the economy other than to protect private property rights and maintain peace. They argue that if the government regulates the economy, it increases costs and eventually hurts society more than it helps.

POLITICAL CARTOONS PRIMARY SOURCE

Should Government Regulate the Economy?

◀ *Entitled "The Consumer Consumed," this cartoon shows a shopper being told that if he buys domestic goods, he has to pay extra money to trusts (monopolies), and if he buys foreign goods, he has to pay extra money (duties) to the government.*

▲ *The original caption for this cartoon read "Goods will be so much cheaper—Democratic argument. But what will happen to all the American factories?"*

Analyzing VISUALS DBQ

1. **Interpreting** What is happening to American factories after the protection gate is opened?
2. **Analyzing** What argument does the cartoon on the left give in favor of free trade?

Laissez-faire relies on supply and demand, rather than the government, to regulate wages and prices. Supporters believe a free market with competing companies leads to greater efficiency and creates more wealth for everyone. Laissez-faire advocates also support low taxes and limited government debt to ensure that private individuals, not the government, will make most of the decisions about how the nation's wealth is spent.

In the late 1800s, the profit motive attracted many capable and ambitious people into business. **Entrepreneurs**—people who risk their capital to organize and run businesses—were attracted by the prospect of making money in manufacturing and transportation. Many entrepreneurs from New England, who had accumulated money by investing in trade, fishing, and textile mills, now invested in factories and railroads. An equally important source of private capital was Europe, especially Great Britain. Foreign investors saw great opportunities for profit in the United States.

In many ways, the United States **practiced** laissez-faire economics in the late 1800s. State and federal governments kept taxes and spending low. They did not impose costly regulations on industry or try to control wages and prices. In other ways, however, the government went beyond laissez-faire and introduced policies intended to promote business.

Since the early 1800s, leaders in the Northeast and the South had different ideas about the proper role of the government in the economy. Northern leaders wanted high tariffs to protect manufacturers from foreign competition and also supported federal subsidies for companies building roads, canals, and railroads. Southern leaders opposed subsidies and favored low tariffs to promote trade and to keep the cost of imported goods low.

The Civil War ended the debate. After the Southern states seceded, the Republican-controlled Congress passed the **Morrill Tariff,** which greatly increased tariff rates. By 1865 tariffs had nearly tripled. Congress also gave vast tracts of Western land and nearly $65 million in loans to Western railroads, and sold public lands with mineral resources for much less than their market value.

In the late 1800s, the United States was one of the largest free trade areas in the world. The Constitution bans states from imposing tariffs, and there were few regulations on commerce or immigration. Supporters of laissez-faire say these factors played a major role in the country's tremendous economic growth.

High tariffs, however, contradicted laissez-faire ideas. When the nation raised tariffs on foreign goods, other countries raised their tariffs on American goods. This hurt American companies trying to sell goods abroad, particularly farmers who sold their products overseas. Despite these problems, many business leaders and members of Congress believed tariffs were necessary. Few believed that new American industries could compete with established European factories without tariffs to protect them. Later, in the early 1900s, after American companies had become large and efficient, business leaders began to push for free trade. They believed they could now compete internationally and win sales in foreign markets.

Reading Check **Analyzing** Do you think government policies at this time helped or hindered industrialization? Why?

Section 1 REVIEW

Vocabulary

1. **Explain** the significance of: gross national product, Edwin Drake, Alexander Graham Bell, Thomas Alva Edison, laissez-faire, entrepreneur, Morrill Tariff.

Main Ideas

2. **Explaining** How did an abundance of natural resources contribute to economic growth in the United States in the late 1800s?

3. **Organizing** Use a graphic organizer similar to the one below to indicate how the inventions listed affected the nature of American work and business.

Invention	Effects
telephone	
lightbulb	
automatic loom	

4. **Describing** How did the principles of the free enterprise system, laissez-faire, and profit motive encourage the rise of industry?

Critical Thinking

5. **Big Ideas** What role did the federal government play in increasing industrialization after the Civil War?

6. **Analyzing Visuals** Examine the time line on pages 412–413. Choose one invention and explain how it changed society.

Writing About History

7. **Descriptive Writing** Imagine you are a young person living in this country in the late 1800s. Choose one of the inventions discussed in the section and write a journal entry describing its impact on your life.

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