

The North



California Standards

History–Social Sciences

8.6 Students analyze the divergent paths of the American people from 1800 to the mid-1800s and the challenges they faced, with emphasis on the Northeast.

Analysis Skills

HI 1 Students explain the central issues and problems from the past.

HI 2 Students understand and distinguish cause, effect, sequence, and correlation in historical events.

English–Language Arts

Writing 8.2.4.b Present detailed evidence, examples, and reasoning to support arguments.

Reading 8.2.0 Students read and understand grade-level appropriate material.

FOCUS ON WRITING



Newspaper Advertisement The Industrial Revolution was a time when a great many new inventions were introduced. You work for an advertising agency, and your job is to design an advertisement for one of the inventions mentioned in this chapter. As you read, take notes on the inventions, their inventors, and how they changed life in the United States. Then choose one invention and design a newspaper advertisement to persuade readers to buy or use the invention.



1807

Robert Fulton's *Clermont* becomes the first commercially successful steamboat.



1790



1790

The first steam-powered mill opens in Great Britain.



Textile mill workers were often women.



HOLT
History's Impact
video series
Watch the video to understand the impact of mass transportation.

What You Will Learn...

New machinery led to the construction of new mills, often along rivers. In this chapter you will learn about changes in the lives of Americans in the North as a result of rapid industrialization.



1830
The *Tom Thumb* becomes the first locomotive in the United States to carry passengers.

1840
Federal government employees receive a 10-hour workday.

1845
Sarah Bagley is appointed secretary of the New England Working Men's Association.

1856
Gail Borden patents a method of condensing milk so that it can be safely stored in cans.

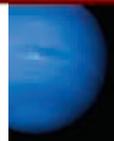


1830

1838
The *Sirius* becomes the first ship to cross the Atlantic Ocean entirely under steam power.

1840

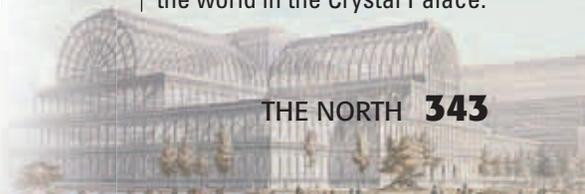
1846
German astronomer Johann Galle observes that Neptune is a planet.



1850

1851
London's Great Exhibition displays inventions from around the world in the Crystal Palace.

1860



Economics

Geography

Politics

Religion

Society
and Culture

Science and
Technology

Focus on Themes As you read this chapter, you will learn about how increased **science and technology** brought about what is called the Industrial Revolution. As a result of the Industrial Revolution, you will see how American **economic**

patterns changed. Next, you will read about how family life changed as more and more people went to work in factories. Finally, you will see how new methods of transportation changed where people lived and how new inventions affected daily life and work.

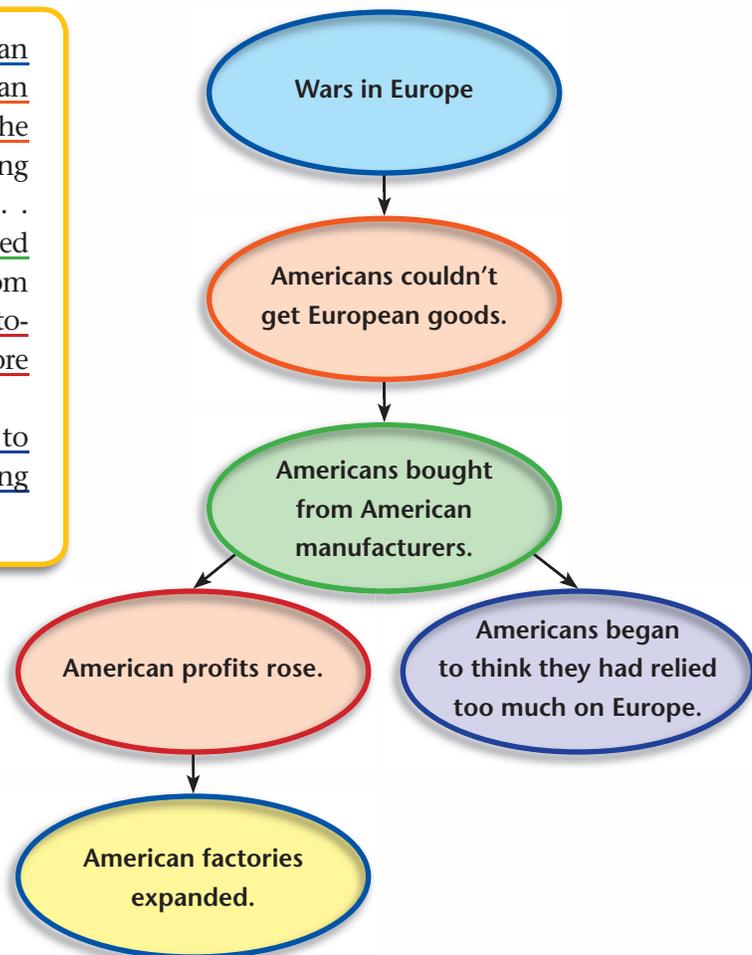
Causes and Effects in History

Focus on Reading Have you heard the saying, “We have to understand the past to avoid repeating it.”? That is one reason we look for causes and effects in history.

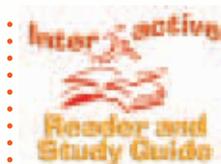
Cause and Effect Chains You might say that all of history is one long chain of causes and effects. It may help you to understand the course of history better if you draw out such a chain as you read.

Since the 1790s, wars between European powers had interfered with U.S. trade. American customers were no longer able to get all the manufactured goods they were used to buying from British and European manufacturers . . . Americans began to buy the items they needed from American manufacturers instead of from foreign suppliers. As profits for American factories grew, manufacturers began to spend more money expanding their factories . . .

At the same time, many Americans began to realize that the United States had been relying too heavily on foreign goods. (p. 351)



Additional reading support can be found in the





ELA Analysis HI 2 Understand and distinguish cause and effect.
HSS Reading 8.2.0 Students read and understand grade-level appropriate material.

Key Terms and People

You Try It!

The following passage is from the chapter you are about to read. As you read each paragraph, ask yourself what is the cause and what is the effect of what is being discussed.

Workers Organize

Factories continued to spread in the 1800s. Craftspeople, who made goods by hand, felt threatened. Factories quickly produced low-priced goods. To compete with factories, shop owners had to hire more workers and pay them less . . .

The wages of factory workers also went down as people competed for jobs. A wave of immigration in the 1840s brought people from other, poorer countries. They were willing to work for low pay. More immigrants came to the Northeast, where the mills were located, than to the South. Competition for jobs also came from people unemployed during the Panic of 1837.

*From
Chapter 11,
p. 356*

After you have read the passage, answer the following questions.

1. What cause is being discussed in the first paragraph? What were its effects?
2. Draw a cause and effect chain that shows the events described in the first paragraph.
3. What main effect is discussed in the second paragraph? How many causes are given for it?
4. Draw a cause and effect chain that shows the events described in the second paragraph.

As you read Chapter 11, look for words that signal causes or effects. Picture these causes and effects as the links in a cause and effect chain.

Chapter 11

Section 1

Industrial Revolution (p. 347)
 textiles (p. 347)
 Richard Arkwright (p. 347)
 Samuel Slater (p. 348)
 technology (p. 349)
 Eli Whitney (p. 349)
 interchangeable parts (p. 349)
 mass production (p. 349)

Section 2

Rhode Island system (p. 353)
 Francis Cabot Lowell (p. 354)
 Lowell system (p. 354)
 trade unions (p. 356)
 strikes (p. 356)
 Sarah G. Bagley (p. 357)

Section 3

Transportation Revolution (p. 358)
 Robert Fulton (p. 359)
 Clermont (p. 359)
 Gibbons v. Ogden (p. 359)
 Peter Cooper (p. 360)

Section 4

Samuel F. B. Morse (p. 364)
 telegraph (p. 364)
 Morse code (p. 365)
 John Deere (p. 366)
 Cyrus McCormick (p. 366)
 Isaac Singer (p. 367)

Academic Vocabulary

Success in school is related to knowing academic vocabulary—the words that are frequently used in school assignments and discussions. In this chapter, you will learn the following academic words:

efficient (p. 347)
 concrete (p. 357)

What You Will Learn...

Main Ideas

1. The invention of new machines in Great Britain led to the beginning of the Industrial Revolution.
2. The development of new machines and processes brought the Industrial Revolution to the United States.
3. Despite a slow start in manufacturing, the United States made rapid improvements during the War of 1812.

The Big Idea

The Industrial Revolution transformed the way goods were produced in the United States.

Key Terms and People

Industrial Revolution, p. 347
 textiles, p. 347
 Richard Arkwright, p. 347
 Samuel Slater, p. 348
 technology, p. 349
 Eli Whitney, p. 349
 interchangeable parts, p. 349
 mass production, p. 349



HSS 8.6.1 Discuss the influence of industrialization and technological developments on the region, including human modification of the landscape and how physical geography shaped human actions (e.g., growth of cities, deforestation, farming, mineral extraction).

The Industrial Revolution in America

If YOU were there...

You live in a small Pennsylvania town in the 1780s. Your father is a blacksmith, but you earn money for the family, too. You raise sheep and spin their wool into yarn. Your sisters knit the yarn into warm wool gloves and mittens. You sell your products to merchants in the city. But now you hear that someone has invented machines that can spin thread and make cloth.

Would you still be able to earn the same amount of money for your family? Why?

BUILDING BACKGROUND In the early 1700s making goods depended on the hard work of humans and animals. It had been that way for hundreds of years. Then new technology brought a change so radical that it is called a revolution. It began in Great Britain and soon spread to the United States.

Beginning of the Industrial Revolution

At the beginning of the 1700s, the majority of people in Europe and the United States were farmers. They made most of what they needed by hand. For example, female family members usually made clothing. First, they used a spinning wheel to spin raw materials, such as cotton or wool, into thread. Then they used a hand loom to weave the thread into cloth.

Some families produced extra cloth to sell to merchants, who sold it for a profit. In towns, a few skilled workers made goods by hand in their own shops. These workers included blacksmiths, carpenters, and shoemakers. Their ways of life had stayed the same for generations.

A Need for Change

By the mid-1700s, however, changes in Great Britain led to a greater demand for manufactured goods. As agriculture and roads

Textile Mill and Water Frame

SCIENCE AND TECHNOLOGY

A water frame adapts the power of flowing water into energy that moves wheels and gears through a system of belts. These wheels and gears then move parts of machines such as looms and spinning wheels.

1 Flowing water from a river turned the waterwheel. The giant wheel turned smaller gears connected to belts. 2 These belts moved parts of the machinery in the mill.

5 After the thread was spun, it moved to the loom to be woven into cloth. Workers called spoolers watched the looms and made sure that the spools of thread were kept straight.

4 Then the raw cotton was spun into thread on a spinning frame.

3 A machine for cleaning the raw cotton was the first step.

ANALYSIS SKILL ANALYZING VISUALS

What provided the power for the machines in the mill?

improved, cities and populations grew. Overseas trade also expanded. Traditional manufacturing methods did not produce enough goods to meet everyone's needs.

People began creating ways to use machines to make things more **efficient**. These changes led to the **Industrial Revolution**, a period of rapid growth in using machines for manufacturing and production that began in the mid-1700s.

Textile Industry

The first important breakthrough of the Industrial Revolution took place in how **textiles, or cloth items**, were made. Before the Industrial Revolution, spinning thread took much more time than making cloth. Several workers were needed to spin enough thread to supply a single weaver.

In 1769 Englishman **Richard Arkwright** invented a large spinning machine called a water frame. The water frame could produce dozens of cotton threads at the same time. It lowered the cost of cotton cloth and increased the speed of textile production.

The water frame used flowing water as its source of power. Merchants began to build large textile mills, or factories, near rivers and streams. The mills were filled with spinning machines. Merchants began hiring people to work in the mills.

Additional improvements also speeded up the spinning process. Britain soon had the world's most productive textile manufacturing industry.

READING CHECK Drawing Conclusions

How did machines speed up textile manufacturing?

ACADEMIC VOCABULARY

efficient
productive and not wasteful

New Machines and Processes

New machines encouraged the rise of new processes in business and manufacturing. As the machines used to make products became more efficient, the processes involved changed dramatically.

Slater and His Secrets

The new textile machines allowed Great Britain to produce cloth faster and cheaper than other countries could. To protect British industry, the British Parliament had made it illegal for skilled mechanics or machine plans to leave the country. Disguised as a farmer, **Samuel Slater**, a skilled British mechanic, immigrated to the United States after carefully memorizing the designs of textile mill machines. Soon after arriving, he sent a letter to Moses Brown, who owned a textile business in New England. Slater claimed he could improve the way textiles were manufactured in the United States.

Brown had one of his workers test Slater's knowledge of machinery. Slater passed. Brown's son, Smith Brown, and son-in-law, William Almy, formed a partnership with Slater. In 1793 they opened their

first mill in Pawtucket, Rhode Island. The production of cotton thread by American machines had begun. Slater ran the mill and the machinery. He was confident that his new machines would work well.

“If I do not make as good yarn as they do in England, I will have nothing for my services, but will throw the whole of what I have attempted over the bridge.”

—Samuel Slater, quoted in *The Ingenious Yankees*, by Joseph and Francis Gies

Slater's machines worked, and the Pawtucket mill became a success. Slater's wife also invented a new cotton thread for sewing. In 1798 Slater formed his own company to build a mill. By the time he died in 1835, he owned all or part of 13 textile mills.

Other Americans began building textile mills. Most were located in the Northeast. In New England in particular, merchants had the money to invest in new mills. More importantly, this region had many rivers and streams that provided a reliable supply of power. Fewer mills were built in the South, partly because investors in the South concentrated on expanding agriculture. There, agriculture was seen as an easier way to make money.

Elements of Mass Production

CONNECT TO ECONOMICS

Mass-production techniques allow manufacturers to efficiently create more goods for the marketplace. Mass production requires the use of interchangeable parts, machine tools, and the division of labor.

What are the three elements of mass production?

Interchangeable Parts

Eli Whitney developed the idea of using interchangeable parts. Interchangeable, or identical, parts are needed so each part does not have to be custom-made by hand.



Yale University Art Gallery, Trumbull Collection



Machine Tools

Machine tools like this one make parts that are identical and therefore interchangeable.

A Manufacturing Breakthrough

Despite these great changes, most manufacturing was still done by hand. In the late 1790s the U.S. government worried about a possible war with France, so it wanted more muskets for the army. Skilled workers made the parts for each weapon by hand. No two parts were exactly alike, and carefully fitting all the pieces together took much time and skill. As a result, American gun makers could not produce the muskets quickly enough to satisfy the government's demand. Factories needed better **technology, the tools used to produce items or to do work.**

In 1798 inventor **Eli Whitney** tried to address some of these problems. Whitney gave officials a proposal for mass-producing guns for the U.S. government using water-powered machinery. Whitney explained the benefits of his ideas.

“I am persuaded that machinery moved by water [and] adapted to this business would greatly reduce the labor and facilitate [ease] the manufacture of this article.”

—Eli Whitney, quoted in *Technology in America*, edited by Carroll W. Pursell

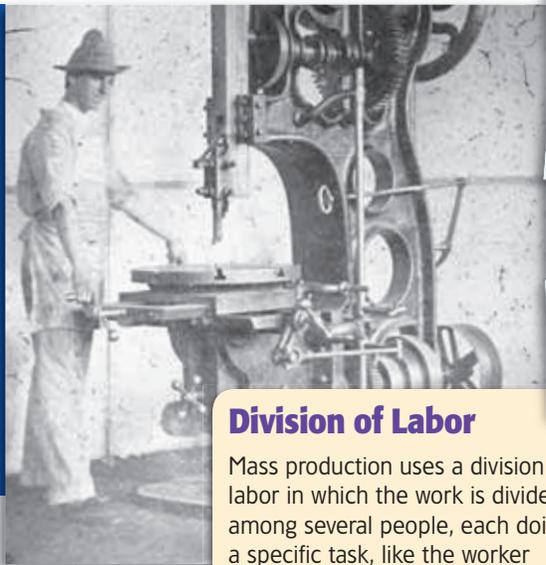
Whitney also came up with the idea of using **interchangeable parts**—parts of a machine that are identical. Using interchangeable parts made machines easier to assemble and broken parts easier to replace. Whitney promised to build 10,000 muskets in two years. The federal government gave him money to build his factory, and in 1801 Whitney was called to Washington, D.C., to give a demonstration.

Whitney stood before President John Adams and his secretary of war. He had an assortment of parts for 10 guns. He then randomly chose parts and quickly assembled them into muskets. To the audience's amazement, he repeated the process several times.

Whitney's Influence

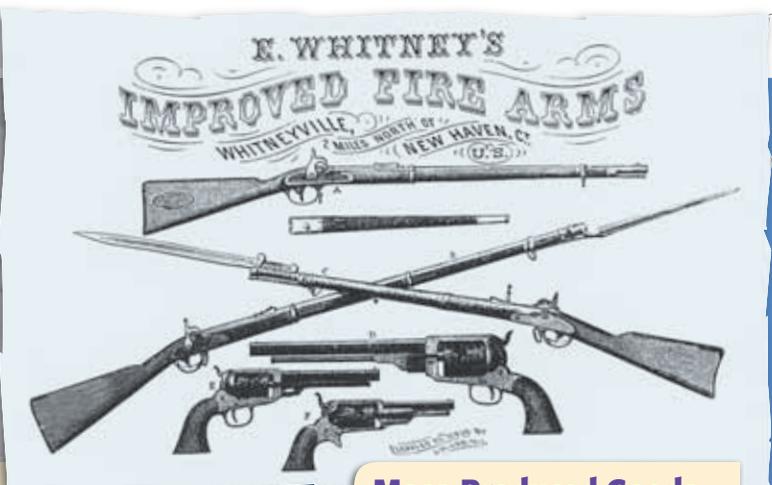
Whitney had proven that American inventors could improve upon the new British technology. Machines that produced matching parts soon became standard in industry. Interchangeable parts sped up **mass production, the efficient production of large numbers of identical goods.**

READING CHECK Summarizing How did Eli Whitney influence American manufacturing?



Division of Labor

Mass production uses a division of labor in which the work is divided among several people, each doing a specific task, like the worker shown here.



Mass-Produced Goods

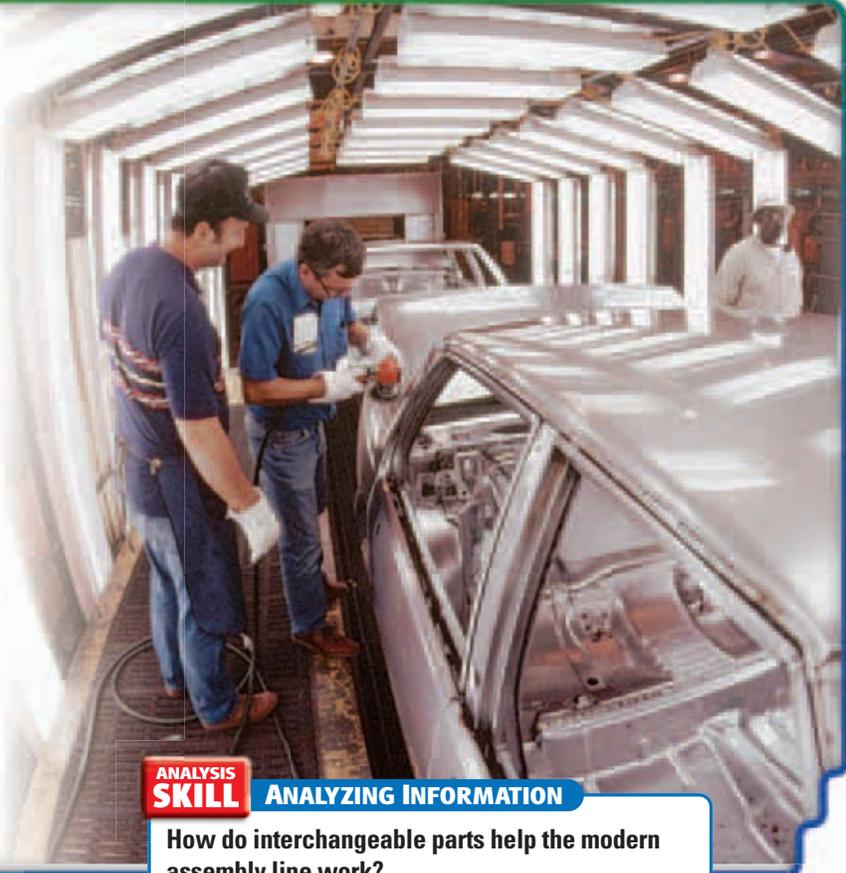
The end result are goods that have been mass-produced. Eli Whitney used mass-production techniques to manufacture firearms.

Modern Manufacturing

The word *manufacture* comes from Latin words that mean “to make by hand.” Yet in modern manufacturing, machines—not human hands—do most of the work.

A key feature of modern manufacturing is the assembly line. An assembly line is a long conveyor belt. As the product moves along the belt, or “down the line,” workers assemble it. Often, the workers use machines to help them. On a growing number of assembly lines, there are no workers at all: the product is assembled by computer-controlled robots.

Although a far cry from Eli Whitney’s factory, modern factories use the same elements of mass production that Whitney did more than 200 years ago.



ANALYSIS SKILL

ANALYZING INFORMATION

How do interchangeable parts help the modern assembly line work?

Slow Start in Manufacturing

Despite the hard work of people such as Samuel Slater and Eli Whitney, manufacturing in the United States grew slowly. In 1810 Secretary of the Treasury Albert Gallatin suggested some reasons why there were so few factories in the United States.

“[The reasons include] ... the superior attractions of agricultural pursuits [farming], ... the abundance of land compared with the population, the high price of labor, and the want [lack] of sufficient capital [investment].”

—Albert Gallatin, quoted in *Who Built America?*
edited by Bruce Levine et al.

Gallatin and others believed that few people would choose to work in a factory if they could own their own farm instead. In Great Britain, on the other hand, land was more scarce and more expensive than in

the United States. As a result, fewer people were able to own farms. British factory workers generally were willing to work for lower wages than factory workers in the United States were.

Because British manufacturers had plenty of factory workers with technical skills, they could produce large amounts of goods less expensively than most American businesses could. Consequently, they could charge lower prices for the goods. Lower British prices made it difficult for many American manufacturers to compete with British companies. This situation in turn discouraged American investors from spending the money needed to build new factories and machinery. As a result, only a few industries had found a place in the American economy. These included cotton goods, flour milling, weapons, and iron production.

These circumstances began to change around the time of the War of 1812. Since the 1790s, wars between European powers had interfered with U.S. trade. American customers were no longer able to get all the manufactured goods they were used to buying from British and European manufacturers. Then, during the War of 1812, British ships blockaded eastern seaports, preventing foreign ships from delivering goods. Americans began to buy the items they needed from American manufacturers instead of from foreign suppliers. As profits for American factories grew, manufacturers began to spend more money expanding their factories. State banks and private investors began to lend money to manufacturers for their businesses.

At the same time, many Americans began to realize that the United States had been relying too heavily on foreign goods. If the United States could not meet its own needs, it might be weak and open to attack. Former president Thomas Jefferson, who had once opposed manufacturing, changed his mind. He realized that manufacturing had to be an important part of America's economy, but he opposed protective tariffs, which he thought gave industry special privileges.

“To be independent for the comforts of life we must fabricate [make] them ourselves. We must now place the manufacturer by the side of the agriculturalist [farmer].”

—Thomas Jefferson, from *The Writings of Thomas Jefferson*, edited by P.L. Ford

In February 1815, New Yorkers celebrated the end of the War of 1812 and the return of free trade. The streets were decorated and filled with merchants whose ships were loaded with goods. “With Peace and Commerce, America Prospers,” declared one display. Eager businesspeople prepared to lead the United States into a period of industrial growth. They urged northern politicians to pass higher tariffs on foreign goods to protect American companies.

READING CHECK Analyzing How did the War of 1812 aid the growth of American manufacturing?

THE IMPACT TODAY

American dependence on some foreign goods, such as oil, is still being debated today.

SUMMARY AND PREVIEW The Industrial Revolution started with the textile industry in England but soon spread to the United States. In the next section you will learn about how the spread of factories changed the working lives of many Americans.

Section 1 Assessment

go.hrw.com
Online Quiz
KEYWORD: SS8 HP11

Reviewing Ideas, Terms, and People **HSS** 8.6.1

1. **a. Identify** What was the first industry to begin to use machines to manufacture goods?
b. Predict In what ways might life for workers change as a result of the **Industrial Revolution**?
2. **a. Recall** In what part of the United States were most mills located? Why?
b. Draw Conclusions How did the ideas of **Samuel Slater** and **Eli Whitney** affect manufacturing in the United States?
c. Evaluate Whose contributions do you think were more important—Slater's textile machines or Whitney's **interchangeable parts**? Why?
3. **a. Identify** What event encouraged the growth of American manufacturing? Why?
b. Contrast Why was manufacturing in Great Britain in the early years more successful than that in the United States?

Critical Thinking

4. **Drawing Conclusions** Copy the chart below. Use it to identify contributions that led to the growth of manufacturing in the United States and what effect each contribution had.

| Contribution | Effect on Manufacturing |
|--------------|-------------------------|
| | |
| | |
| | |
| | |

FOCUS ON WRITING

5. **Noting Inventions** In your notebook, create a three-column chart. In the first column, list any inventions mentioned in this section. In the second column, identify the inventor. In the third column, describe the invention and its benefits.

Changes in Working Life

What You Will Learn...

Main Ideas

1. The spread of mills in the Northeast changed workers' lives.
2. The Lowell System revolutionized the textile industry in the Northeast.
3. Workers organized to reform working conditions.

The Big Idea

The introduction of factories changed working life for many Americans.

Key Terms and People

Rhode Island system, p. 353

Francis Cabot Lowell, p. 354

Lowell system, p. 354

trade unions, p. 356

strikes, p. 356

Sarah G. Bagley, p. 357



HSS 8.6.1 Discuss the influence of industrialization and technological developments on the region, including human modification of the landscape and how physical geography shaped human actions (e.g., growth of cities, deforestation, farming, mineral extraction).

If YOU were there...

You live on a dairy farm in Massachusetts in about 1820. On the farm, you get up at dawn to milk the cows, and your work goes on until night. But now you have a chance at a different life. A nearby textile mill is hiring young people. You would leave the farm and live with other workers. You could go to classes. Most important, you could earn money of your own.

Would you go to work in the textile mill? Why?

BUILDING BACKGROUND As factories and mills were established, the way people worked changed drastically. One dramatic change was the opportunity that factory work gave to young women. For young women in farm families, it was almost the only chance they had to earn their own money and a measure of independence.

Mills Change Workers' Lives

Workers no longer needed the specific skills of craftspeople to run the machines of the new mills. The lives of workers changed along with their jobs. Resistance to these changes sometimes sparked protests.

Many mill owners in the United States could not find enough people to work in factories because other jobs were available. At first, Samuel Slater and his two partners used apprentices—young men who worked for several years to learn the trade. However, they often were given only simple work. For example, their jobs included feeding cotton into the machines and cleaning the mill equipment. They grew tired of this work and frequently left. Apprentice James Horton, for example, ran away from Slater's mill. "Mr. Slater . . . keep me always at one thing . . .," Horton complained. "I might have stayed there until this time and never knew nothing."

Eventually, Slater began to hire entire families who moved to Pawtucket to work in the mills. This practice allowed Slater to fill his labor needs at a low cost. Children as well as adults worked in the mills.

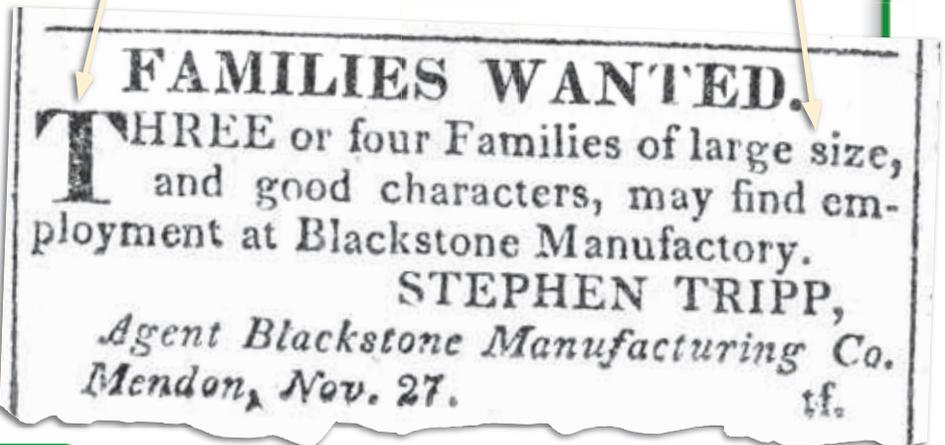
Primary Source

NEWSPAPER ADVERTISEMENT Family Wanted

This advertisement appeared in a Mendon, Massachusetts, newspaper in 1823. In it, a company requests that families come to work at a factory. The practice of hiring entire families was common at the time, especially in Britain. In America, it became known as the Rhode Island system.

The advertisement requests more than one family.

Why do you think Blackstone wants large families?



ANALYSIS SKILL

ANALYZING PRIMARY SOURCES

Drawing Conclusions Do you think advertisements like this one had the effect the companies wanted?

On most farms children worked to help their families. Therefore, few people complained about the hiring of children to work in factories. H. Humphrey, an author of books on raising children, told parents that children needed to be useful. Humphrey wrote, "If he [a child] will not study, put him on to a farm, or send him into the shop, or in some other way provide regular employment for him." The machines made many tasks in the mill simple enough for children to do. Mill owners profited because they paid children low wages. Adults usually earned as much in a day as most children did in a week.

To attract families to his mill, Slater built housing for the workers. He also provided them with a company store where they could buy necessities. In addition, he started the practice of paying workers with credit at the company store. Instead of paying the full price for an item all at once, small payments could be made over a period of time. This practice allowed Slater to reinvest his money in his business.

Slater's strategy of hiring families and dividing factory work into simple tasks became known as the **Rhode Island system**.

Mill owners throughout the Northeast copied Slater's methods. Owners advertised with "Men with growing families wanted." They also sent recruiters to poor communities to find new workers. For many people, the chance to work in a factory was a welcome opportunity to earn money and to learn a new skill.

One of the earliest of the mill towns, Slatersville, was named after Samuel Slater. The town was built by Slater and his brother John. It included two houses for workers and their families, the owner's house, the company store, and the Slatersville Mill. The mill was the largest and most modern industrial building of its time.

The mills employed not only the textile workers who operated the machinery but also machine part makers and dam builders. Although the company store sold food and necessary items to workers, mill towns supported the same variety of businesses any other town needed to thrive. These included tailors and dressmakers, butchers, and other small workshops.

READING CHECK Summarizing What problem did Slater have in his mills, and how did he solve it?

The Lowell System

Not all mill owners followed this system. **Francis Cabot Lowell**, a businessman from New England, developed a very different approach. His ideas completely changed the textile industry in the Northeast.

The **Lowell system** was based on water-powered textile mills that employed young, unmarried women from local farms. The system included a loom that could both spin thread and weave cloth in the same mill. Lowell constructed boardinghouses for the women. Boardinghouse residents were given a room and meals along with their jobs.

With financial support from investors of the Boston Manufacturing Company, Lowell's first textile mill opened in Waltham, Massachusetts, in 1814. "From the first starting of the first power loom there was not . . . doubt about the success," wrote one investor. In 1822, the company built a larger mill in a Massachusetts town later named Lowell. Visitors to Lowell were amazed by the clean factories and neatly kept boardinghouses as well as the new machinery.

The young millworkers soon became known as Lowell girls. The mills paid them between \$2 and \$4 each week. The workers paid \$1.25 for room and board. These wages were much better than those women could earn per week in other available jobs, such as domestic work.

Many young women came to Lowell from across New England. They wanted the chance to earn money instead of working on the family farm. "I must of course have something of my own before many more years have passed over my head," wrote one young woman. The typical Lowell girl worked at the mills for about four years.

Unlike other factory workers, the Lowell girls were encouraged to use their free time to take classes and form women's clubs. They even wrote their own magazine, the *Lowell Offering*. Lucy Larcom, who started working at Lowell at age 11, later praised her fellow workers.



No record exists today of the name of this girl, who worked in a mill around 1850. Judging from the photograph, if she were in school today, she would probably be in the seventh or eighth grade. Although hard to see in this photograph, her hands and arms are scratched and swollen—telltale signs of the hard labor required of young girls who worked up to 14 hours per day.

TIME TABLE OF THE LOWELL MILLS

Morning Bells

First bell 4:30 AM

Second bell 5:30 AM

Third bell 6:20 AM

Dinner (Lunch) Bells

Ring out 12:00 PM

Ring in 12:35 PM

Evening Bells

Ring out 6:30 PM

Except on Saturday Evenings

—*The Table of the Lowell Mills, October 21, 1851*

History Close-up

Life of a Mill Girl

Girls had to keep their hair pulled back so it did not get caught in the machines, resulting in serious injury—or death.

Windows were rarely opened, to prevent air from blowing the threads. The result is a hot, stuffy room.

The air is dirty and causes breathing problems. One visitor remarked, “The atmosphere . . . is charged with cotton filaments and dust, which . . . are very injurious to the lungs.”

This girl is straightening threads as they enter the power loom, a job that cut her hands.

Girls must shout to be heard above the noise of the power looms. Visitors to the mill routinely referred to the sound of the machines as “deafening.”

ANALYSIS SKILL ANALYZING VISUALS

Judging from the photograph on page 354, what might be the condition of the girl's hands in this illustration? Why?

Primary Source

MAGAZINE ARTICLE

Sarah G. Bagley and Workers' Rights

Lowell girl Sarah G. Bagley wrote magazine articles and made speeches about working in the mills. She organized workers to help change conditions.

Bagley says that mill girls work to help their family members.

Bagley believes that most mill girls would leave their jobs if they could.

“Is anyone such a fool as to suppose that out of six thousand factory girls in Lowell, sixty would be there if they could help it? Whenever I raise the point that it is immoral to shut us up in a close room twelve hours a day in the most monotonous and tedious of employment I am told that we have come to the mills voluntarily and we can leave when we will. Voluntarily! . . . the whip which brings us to Lowell is necessity. We must have money; a father's debts are to be paid, an aged mother to be supported, a brother's ambition to be aided and so the factories are supplied. Is this to act from free will? . . . Is this freedom? To my mind it is slavery.”

—Sarah G. Bagley, quoted in *The Belles of New England: The Women of the Textile Mills and the Families Whose Wealth They Wove*, by William Moran

ANALYSIS SKILL

ANALYZING PRIMARY SOURCES

How did Bagley view the idea that workers must endure poor conditions?

“I regard it as one of the privileges [advantages] of my youth that I . . . [grew] up among those active, interesting girls, whose lives . . . had principle [ideals] and purpose distinctly their own.”

—Lucy Larcom, from *A New England Girlhood*

Mill life was hard, however. The workday was between 12 and 14 hours long, and daily life was carefully controlled. Ringing bells ordered workers to breakfast or lunch. Employees had to work harder and faster to keep up with new equipment. Cotton dust also began to cause health problems, such as chronic cough, for workers.

THE IMPACT TODAY

In the 1950s, labor union membership reached its peak; about 40 percent of the workforce belonged to unions. Today only about 14 percent of the working population belongs to a labor union.

READING CHECK

Contrasting How was the Lowell system different from the Rhode Island system?

Workers Organize

Factories continued to spread in the 1800s. Craftspeople, who made goods by hand, felt threatened. Factories quickly produced low-priced goods. To compete with factories, shop owners had to hire more workers and pay them less. Shoemaker William Frazier complained about the situation in the mid-1840s. “We have to sit on our seats from twelve to sixteen hours per day, to earn one dollar.”

The wages of factory workers also went down as people competed for jobs. A wave of immigration in the 1840s brought people from other, poorer countries. They were willing to work for low pay. More immigrants came to the Northeast, where the mills were located, than to the South. Competition for jobs also came from people unemployed during the financial Panic of 1837. For example, about 50,000 workers in New York City alone had lost their jobs.

The Beginning of Trade Unions

Facing low wages and the fear of losing their jobs, skilled workers formed **trade unions**, groups that tried to improve pay and working conditions. Eventually, unskilled factory workers also formed trade unions. Most employers did not want to hire union workers. Employers believed that the higher cost of union employees prevented competition with other manufacturers.

Sometimes labor unions staged protests called **strikes**. Workers on strike refuse to work until employers meet their demands. Most early strikes were not successful, however. Courts and police usually supported companies, not striking union members.

Labor Reform Efforts

A strong voice in the union movement was that of millworker **Sarah G. Bagley**. She founded the Lowell Female Labor Reform Association in 1844 and publicized the struggles of factory laborers. The association's two main goals were to influence an investigation of working conditions by the Massachusetts state legislature and to obtain a 10-hour workday. Members of the association passed out pamphlets and circulated petitions.

President Martin Van Buren had granted a 10-hour workday in 1840 for many federal employees. Bagley wanted this rule to apply to employees of private businesses. These men and women often worked 12 to 14 hours per day, six days per week.

Many working men and women supported the 10-hour-workday campaign, despite the opposition of business owners. In 1845 Sarah Bagley was elected vice president of the New England Working Men's Association. She was the first woman to hold such a high-ranking position in the American labor movement.

Over time, the unions achieved some **concrete** legal victories. Connecticut, Maine, New Hampshire, Ohio, Pennsylvania, and a few other states passed 10-hour-workday laws.

For factory workers in other states, long hours remained common. One witness described how children were “summoned by the factory bell before daylight” and worked until eight o'clock at night “with nothing but [a] recess of forty-five minutes to get their dinner.” Union supporters continued to fight for work reforms such as an end to child labor in factories during the 1800s.

READING CHECK Finding Main Ideas

Why did workers form unions, and what were the main goals of union reformers?

SUMMARY AND PREVIEW With the growth of factories, workers faced new opportunities and challenges. In the next section you will learn about how the Transportation Revolution brought changes to commerce and the daily lives of Americans.

ACADEMIC VOCABULARY

concrete
specific, real

Section 2 Assessment

go.hrw.com

Online Quiz

KEYWORD: SS8 HP11

Reviewing Ideas, Terms, and People HSS 8.6.1

- a. Identify** What problems did many mill owners have in finding workers?

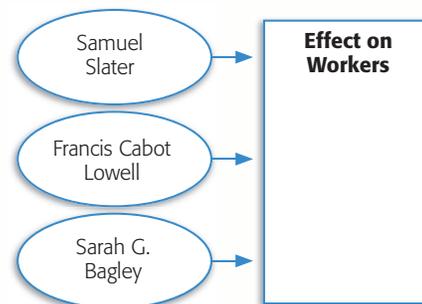
b. Analyze How did Samuel Slater's **Rhode Island system** change employment practices in mills?
- a. Describe** What was life like for mill workers in the **Lowell system**?

b. Make Inferences Why would young women have wanted to go to work in the Lowell mills?
- a. Recall** Why did workers form **trade unions**?

b. Predict What are some possible problems that might arise between factory owners and trade unions?

Critical Thinking

- 4. Drawing Conclusions** Copy the graphic organizer shown. Use it to identify the ways in which each leader affected the lives of workers.



FOCUS ON WRITING

- 5. Examining Working Conditions** This section tells about mill life and conditions for workers. In the chart you started for the first section, list the two labor systems used by mills, the person who developed each, and the benefits of each system.

The Transportation Revolution

What You Will Learn...

Main Ideas

1. The Transportation Revolution affected trade and daily life.
2. The steamboat was one of the first developments of the Transportation Revolution.
3. Railroads were a vital part of the Transportation Revolution.
4. The Transportation Revolution brought many changes to American life and industry.

The Big Idea

New forms of transportation improved business, travel, and communication in the United States.

Key Terms and People

Transportation Revolution, p. 358

Robert Fulton, p. 359

Clermont, p. 359

Gibbons v. Ogden, p. 359

Peter Cooper, p. 360



HSS 8.6.1 Discuss the influence of industrialization and technological developments on the region, including human modification of the landscape and how physical geography shaped human actions (e.g., growth of cities, deforestation, farming, mineral extraction).

If YOU were there...

You live in a small town in Iowa in the 1860s. You've never been more than 30 miles from home and have always traveled by wagon or on horseback. Now there are plans to build a railroad westward from Chicago, 200 miles to the east. The tracks will come through your town! Twice a week, trains will bring goods from the city and take people farther west.

How would the coming of the railroad change your life?



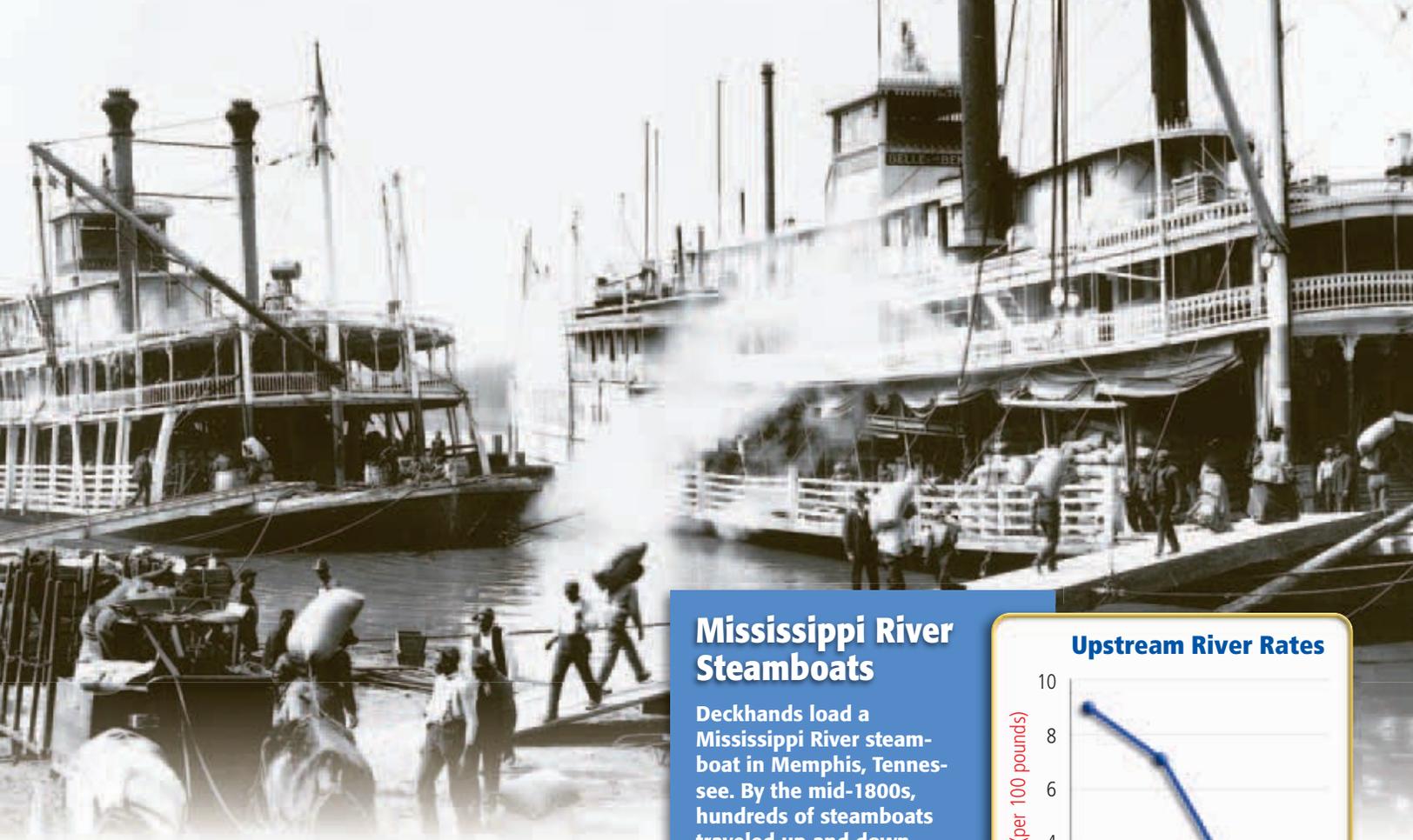
BUILDING BACKGROUND The Industrial Revolution changed how goods were made. It brought great changes in the ways that many Americans lived. But changes in technology led to major changes in other areas of life, too. Changes in transportation would bring remote parts of America closer together.

Trade and Daily Life

During the 1800s the United States experienced a **Transportation Revolution** —a period of rapid growth in the speed and convenience of travel because of new methods of transportation. The Transportation Revolution created a boom in business across the country, particularly by reducing shipping time and costs. As one foreign observer declared in 1835, “The Americans . . . have joined the Hudson to the Mississippi, and made the Atlantic Ocean communicate with the Gulf of Mexico.”

These improvements were made possible largely by the invention of two new forms of transportation: the steamboat and steam-powered trains. They enabled goods, people, and information to travel rapidly and efficiently across the United States.

READING CHECK Finding Main Ideas What benefits did the Transportation Revolution bring to trade and daily life?



Steamboats

American and European inventors had developed steam-powered boats in the late 1700s. However, they were not in wide use until the early 1800s.

Steamboat Era

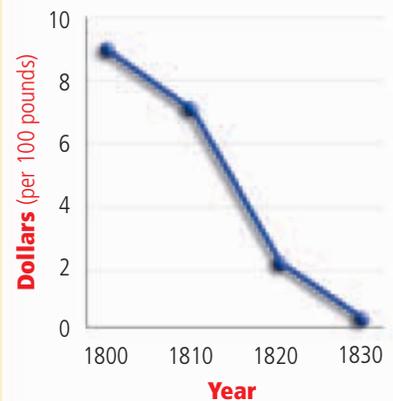
In 1803 American **Robert Fulton** tested his first steamboat design in France. Several years later, he tested the first full-sized commercial steamboat, called the **Clermont**, in the United States. On August 9, 1807, the *Clermont* traveled against the current up the Hudson River without trouble. Demand for steamboat ferry service soon arose.

The steamboat was well suited for river travel. It could move upriver and did not rely on wind power. Steamboats increased trade and profits because goods could be moved quickly and thus more cheaply. More than 500 steamboats were in use in the United States by 1840. By the 1850s, steamboats were also being used to carry people and goods across the Atlantic Ocean.

Mississippi River Steamboats

Deckhands load a Mississippi River steamboat in Memphis, Tennessee. By the mid-1800s, hundreds of steamboats traveled up and down American rivers. Steamboats enabled Americans to ship more goods farther, faster, and for less money than ever before.

Upstream River Rates



Gibbons v. Ogden

Increased steamboat shipping led to conflict over waterway rights. In 1819 Aaron Ogden sued Thomas Gibbons for operating steamboats in New York waters that Ogden said he owned. Gibbons did not have a license to operate in New York, but argued that his federal license gave him the right to use New York waterways.

In the case of **Gibbons v. Ogden**, which reached the Supreme Court in 1824, the Court reinforced the federal government's authority to regulate trade between the states by ending monopolistic control over waterways in several states. The ruling freed up waters to even greater trade and shipping.

READING CHECK Summarizing Explain the effects of the *Gibbons v. Ogden* ruling.

American Railroads

What the steamboat did for water travel, the train did for overland travel. Steam-powered trains had first been developed in Great Britain in the early 1800s. However, they did not become popular in the United States until the 1830s. In 1830 **Peter Cooper** built a small but powerful locomotive called the *Tom Thumb*. He raced the locomotive against a horse-drawn railcar. Eyewitness John Latrobe later described the race, in which *Tom Thumb* had a slow start and fell behind. Latrobe wrote, "The pace increased, the passengers shouted, the engine gained on the horse . . . then the engine passes the horse, and a great hurrah hailed the victory." Unfortunately for Cooper, victory was spoiled when *Tom Thumb* broke down and lost the race near the end.

Despite the defeat, the contest showed the power and speed of even a small locomotive. Railroad fever soon spread. By 1840 railroad companies had laid about 2,800 miles of track—more than existed in all of

Europe. French economist Michel Chevalier described Americans as having "a perfect passion for railroads."

As more railroads were built, engineers and mechanics overcame many tough challenges. Most British railroads, for example, ran on straight tracks across flat ground. In the United States, however, many railroads had to run up and down steep mountains, around tight curves, and over swift rivers. Railroad companies also built the tracks quickly and often with the least expensive materials available. As time went on, engineers and mechanics built heavier, faster, and more powerful steam locomotives.

By 1860 about 30,000 miles of railroad linked almost every major city in the eastern United States. As a result, the economy surged forward. For example, American locomotives hauled more freight than those in any other country. The railroad companies quickly became some of the most powerful businesses in the nation. As the railroad sys-

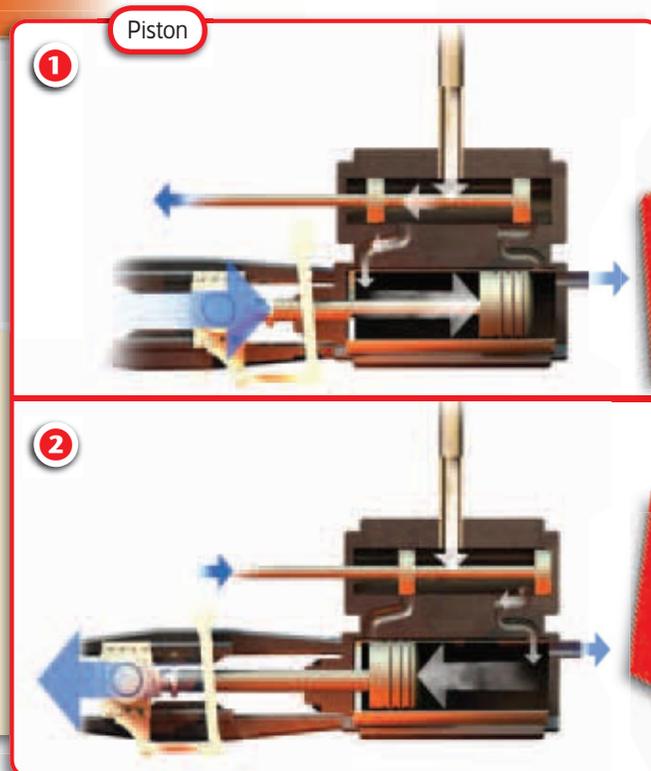
The Steam Train

SCIENCE AND TECHNOLOGY

Boiling water produces steam, which pushes pistons back and forth in a steam engine. These pistons are connected to rods that rotate the wheels of the locomotive.

Why does the train have a firebox?

- 1 As steam follows the path of the white arrows in to the cylinder, the pressure pushes the piston in the direction of the large blue arrow. Connecting rods turn the wheel half a turn.
- 2 When the small valve rod moves, the other valve is blocked, pushing steam into the other side of the cylinder. The pressure moves the piston in the direction of the large blue arrow and the wheel completes a turn.



tem grew, manufacturers and farmers were able to send their goods to distant markets.

In addition to their tremendous economic impact, the railroads made a powerful impression on the senses of passengers and observers. Trains were the fastest form of transportation most people had ever experienced. While wagons often traveled less than 2 miles per hour, locomotives averaged about 20 miles per hour. Writer George Templeton Strong of New York City described the thrill of a steam train passing by in the night:

“Whizzing and rattling and panting, with its fiery furnace gleaming in front, its chimney vomiting fiery smoke above, and its long train of cars rushing along behind like the body and tail of a gigantic dragon— . . . and all darting forward at the rate of twenty miles an hour. Whew!”

—George Templeton Strong, quoted in *The Market Revolution* by Charles Sellers

Riding on the early trains was often an adventure, but it could also be quite dangerous. Engineers trying to stay on time sometimes traveled too fast. English citizen Charles Richard Weld was on a railroad car that flew off the tracks. To his amazement, the other passengers did not complain about the accident. Instead, they praised the engineer for trying to keep on schedule!

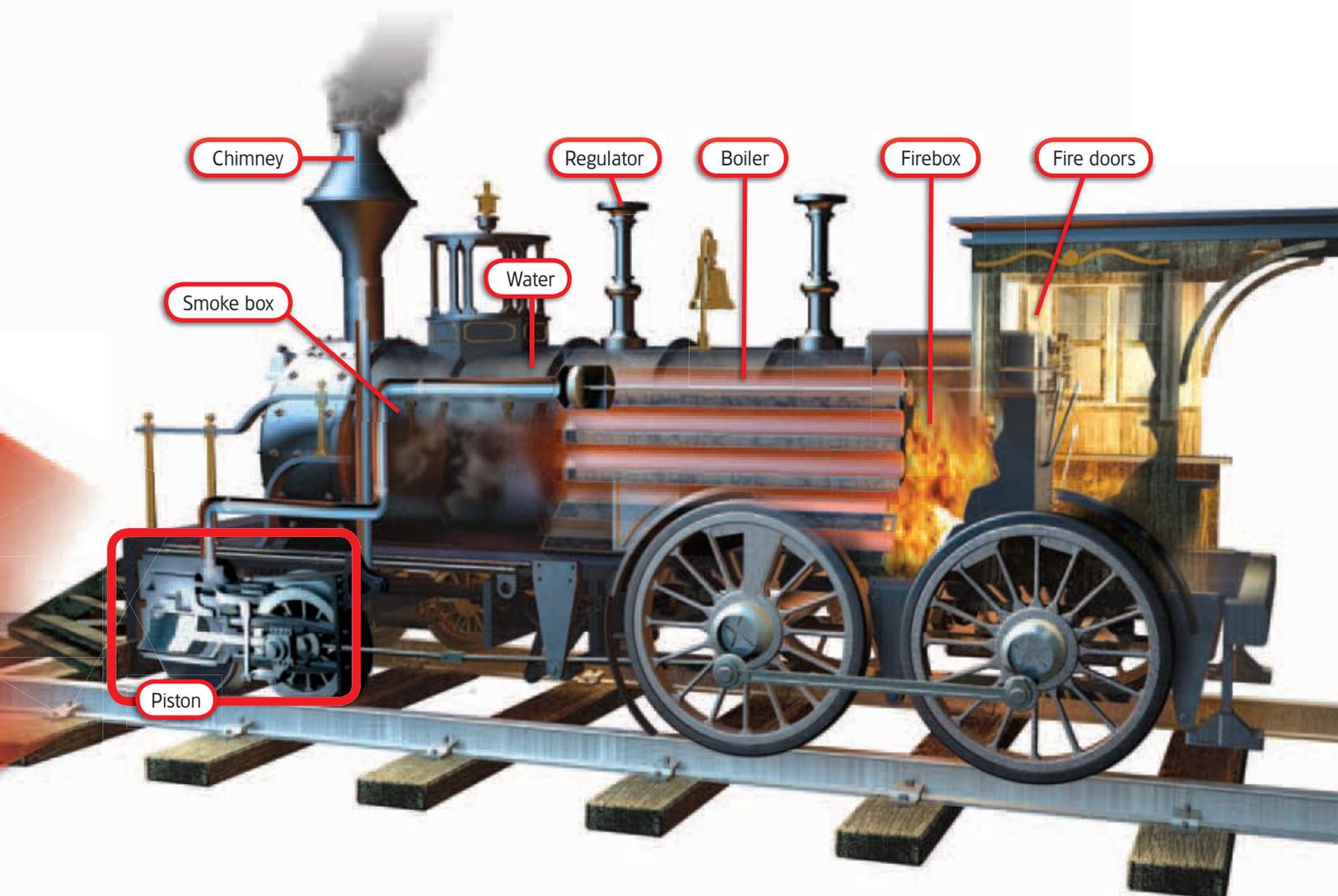
Passengers accepted such risks because the railroads reduced travel time dramatically. Railroads also helped tie communities together. In 1847 Senator Daniel Webster spoke for many people in the United States when he declared that the railroad “towers above all other inventions of this or the preceding age.”

READING CHECK Drawing Inferences

In what ways did railroads affect the economy of the United States?

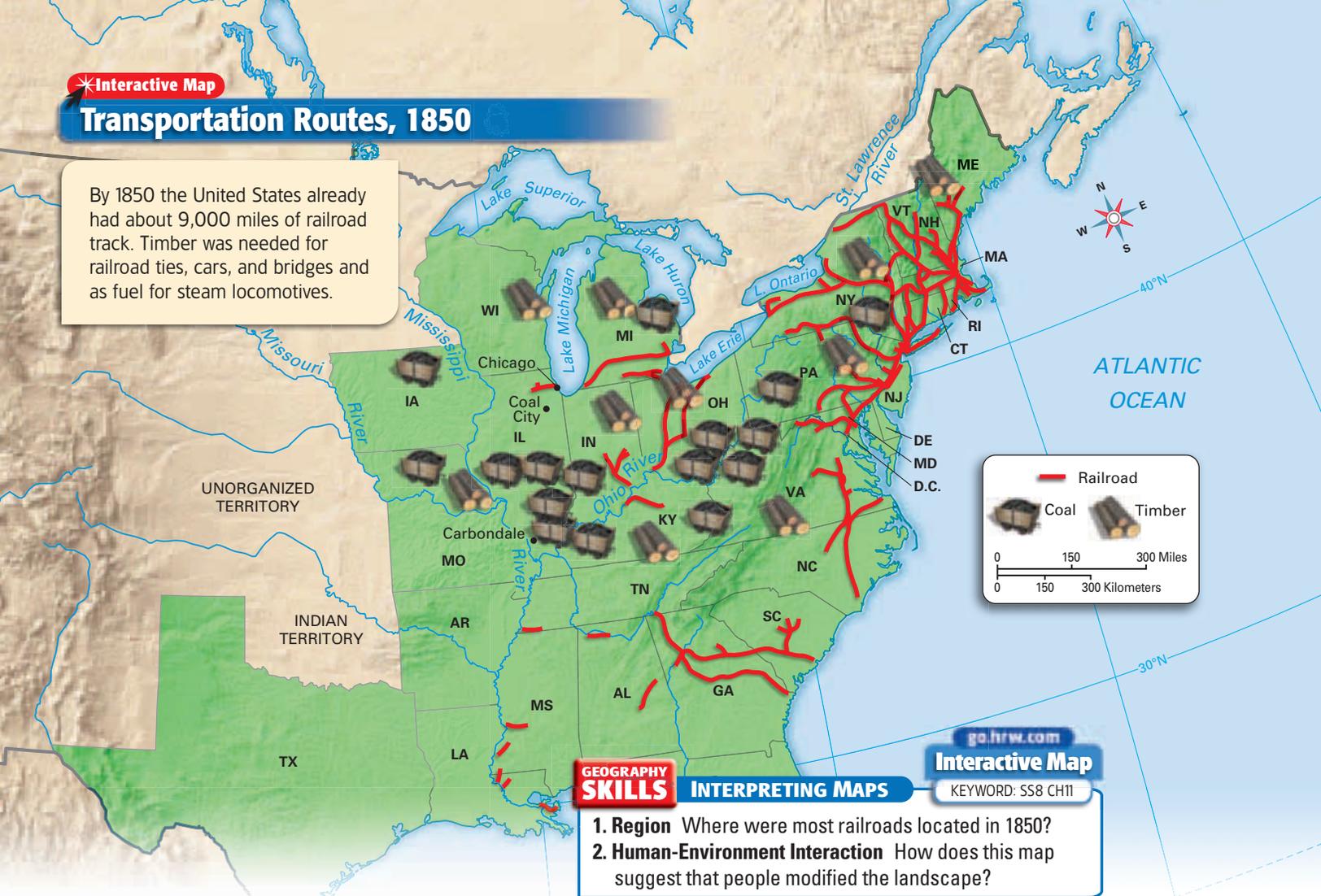
THE IMPACT TODAY

In 1883 four standard time zones were introduced in the United States to help railroads offer uniform train schedules. Today travelers might cross one or more time zones in a single airplane flight.



Transportation Routes, 1850

By 1850 the United States already had about 9,000 miles of railroad track. Timber was needed for railroad ties, cars, and bridges and as fuel for steam locomotives.



GEOGRAPHY SKILLS

INTERPRETING MAPS

Interactive Map

KEYWORD: SS8 CH11

- 1. Region** Where were most railroads located in 1850?
- 2. Human-Environment Interaction** How does this map suggest that people modified the landscape?

Transportation Revolution Brings Changes

The Transportation Revolution brought many changes to America. Steamboats and railroads made getting goods to distant markets much easier and less costly. People in all areas of the nation now had access to products made and grown far away. More than ever before, there was a national economy. The wealth, however, was centered in the North.

Railroads contributed to the expansion of the borders of the nation and guided population growth. Towns sprang up at railroad junctions. Those towns that did not have railroads nearby suffered. Cities grew as trains brought new residents and raw materials for industry and construction. The growing prosperity of the nation, especially in the North, encouraged Americans to take pride in their country.

A New Fuel

The Transportation Revolution also increased the use of certain natural resources that had not been important until then. Throughout the early Transportation Revolution, wood was the primary source of fuel for trains and steamboats, as well as for cooking, light, and heat. As faster locomotives were built, coal replaced wood as the main source of power. A half ton of coal produces as much energy as two tons of wood but at half the cost. Coal also became popular for heating homes. Railroads transported the coal from mines to towns and cities.

As the demand for coal increased, a coal-mining industry developed in many states, including Pennsylvania, western Virginia, and Illinois. Coal mining changed the landscape in a number of ways. New towns, such as Coal City and Carbondale in Illinois,

sprang up in places where coal deposits existed. Miners made deep gashes in the earth removing the coal.

Later, in the 1870s, the demand for coal increased as the demand for steel grew. Steel is made through a smelting process—heating iron ore to very high temperatures. Coal was used to fire the furnaces. Steel, which is much stronger than iron, was increasingly used to build factories and the machines they produced. Steel was also used to make the rails that trains ride on.

The growing market for steel helped fuel the need for more railroads. Railroads transported steel to places where new factories were being built. Railroads also brought new steel farming tools and machines to farmers in the Midwest. Using the new equipment, farmers produced more crops. Railroads then transported their harvests to markets.

Effects of Railroads

The railroads played a role in the growth of other businesses as well. The logging indus-

try expanded as people in the growing towns and cities needed wood for houses and furniture. As newspaper publishing increased, demand for paper grew. Lumber items became the primary product of New England. Settlers spreading out across the Midwest cut down trees and plowed up prairies to make farmland. Deforestation, or cutting down and removing trees, took place on a large scale.

Railroads also caused cities to grow. Some cities became transportation hubs. Chicago was one such city. Its location on Lake Michigan made it an ideal transportation hub, linking the Midwest to the East and South.

FOCUS ON READING

What causes and effects do you see in this section?

READING CHECK Analyzing Information

What role did railroads play in the growth of the coal industry?

SUMMARY AND PREVIEW The Transportation Revolution changed the way business was done. In the next section you will learn about more technological advances.

Section 3 Assessment

go.hrw.com

Online Quiz

KEYWORD: SS8 HPT1

Reviewing Ideas, Terms, and People **HSS** 8.6.1

- a. Identify** What forms of transportation were improved or invented at this time?

b. Explain What effect did the **Transportation Revolution** have on the United States?
- a. Describe** What were the benefits of steamboat travel?

b. Analyze What effect did the ruling in the **Gibbons v. Ogden** case have on federal government?
- a. Describe** What event showed the power and speed of locomotives?

b. Draw Conclusions How did railroads affect trade and business in the United States?

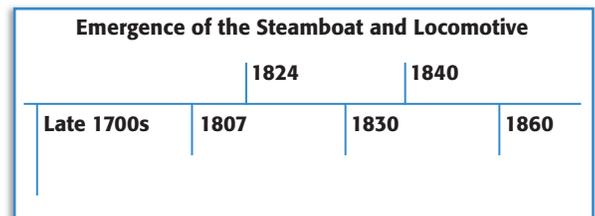
c. Elaborate Why do you think Americans were fascinated by railroads?
- a. Describe** What physical obstacles did railroad construction in the United States face?

b. Analyze What effects did the Transportation Revolution have on the U.S. economy?

c. Elaborate Do you think the Transportation Revolution played a role in deforestation? Explain.

Critical Thinking

- Sequencing** Copy the time line on your own paper. Use it to list the key events that led to the emergence of the steamboat and the locomotive in the United States.



FOCUS ON WRITING

- Describing Travel Inventions** Add the steamboat and locomotive to your list. Note the individuals involved in their development as well as how these new methods of travel changed life for people in the United States.

More Technological Advances

What You Will Learn...

Main Ideas

1. The telegraph made swift communication possible from coast to coast.
2. With the shift to steam power, businesses built new factories closer to cities and transportation centers.
3. Improved farm equipment and other labor-saving devices made life easier for many Americans.
4. New inventions changed lives in American homes.

The Big Idea

Advances in technology led to new inventions that continued to change daily life and work.

Key Terms and People

Samuel F. B. Morse, *p. 364*
telegraph, *p. 364*

Morse code, *p. 365*

John Deere, *p. 366*

Cyrus McCormick, *p. 366*

Isaac Singer, *p. 367*



HSS 8.6.1 Discuss the influence of industrialization and technological developments on the region, including human modification of the landscape and how physical geography shaped human actions (e.g., growth of cities, deforestation, farming, mineral extraction).

If YOU were there...

You own a small shop in Chicago, Illinois, in the 1850s. You sell ladies' hats and gowns. When you need more hats, you send a letter to the manufacturer in New York. Sometimes it takes weeks for the letter to get there. One day, the owner of the shop next door tells you about a wonderful new machine. It can send orders from Chicago to New York in just minutes!

How would a machine like this change your business?

BUILDING BACKGROUND The Industrial and Transportation revolutions had far-reaching effects on Americans' lives. They led to still more innovations in technology. Some of the new machines and devices speeded up processes for business owners. Others made life easier for people at home.

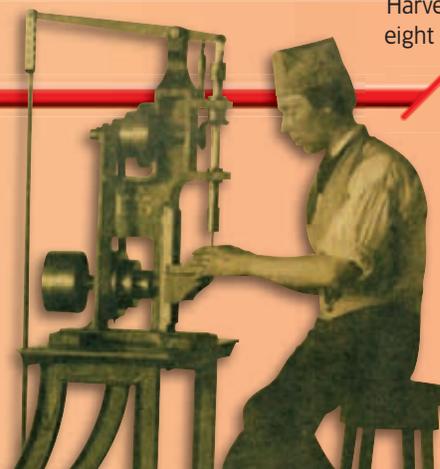
Telegraph Speeds Communication

In 1832 **Samuel F. B. Morse** perfected the **telegraph**—a device that could send information over wires across great distances. To develop the telegraph, Morse studied electricity and magnetism.

Time Line

American Inventions

1798 Eli Whitney proposed the idea of mass producing guns. Machines like this one made it possible for workers to make interchangeable parts efficiently.



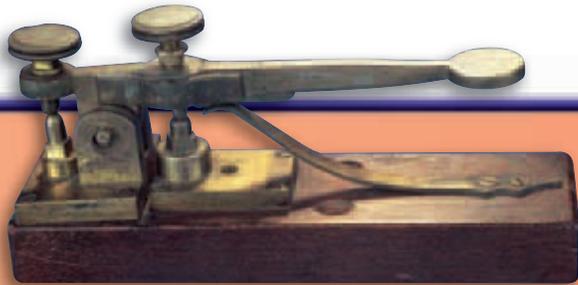
1831 Cyrus McCormick invents the mechanical reaper. Harvesting grain becomes eight times more efficient.

Morse put the work of other scientists together in a practical machine.

The telegraph sent pulses, or surges, of electric current through a wire. The telegraph operator tapped a bar, called a telegraph key, that controlled the length of each pulse. At the other end of the wire, these pulses were changed into clicking sounds. A short click was called a dot. A long click was called a dash. Morse's partner, Alfred Lewis Vail, developed a system known as **Morse code**—different combinations of dots and dashes that represent each letter of the alphabet. For example, *dot dot dot*, *dash dash dash*, *dot dot dot* is the distress signal called SOS. Skilled telegraph operators could send and receive many words per minute.

Several years passed before Morse was able to connect two locations with telegraph wires. Despite that achievement, people doubted his machine. Some people did not think that he was reading messages sent from miles away. They claimed that he was making lucky guesses.

Morse's break came during the 1844 Democratic National Convention in Baltimore, Maryland. A telegraph wired news of the presidential candidate's nomination to politicians in Washington. The waiting politicians responded, "Three cheers for the telegraph!" Telegraphs were soon sending and receiving information for businesses, the government, newspapers, and private citizens.



1832 Samuel F. B. Morse invents the telegraph. Long-distance communication becomes almost instantaneous.

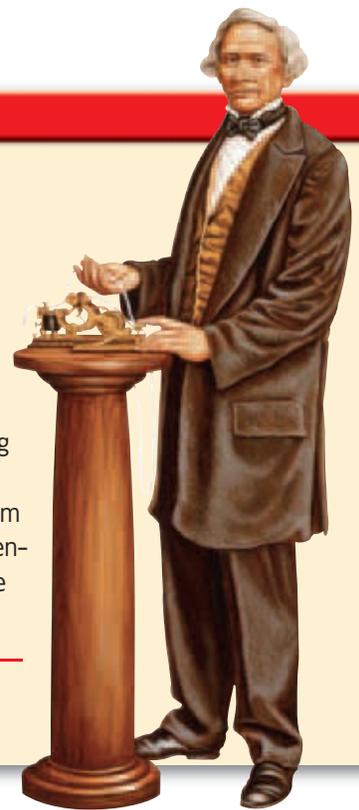
BIOGRAPHY

Samuel F. B. Morse

(1791–1872)

Like steamboat creator Robert Fulton, Samuel F. B. Morse began his career as a painter rather than as an inventor. In 1832 Morse was a widower struggling to raise his three children alone. He became interested in the idea of sending messages electrically. Morse hoped he could invent a device that would earn him enough money to support his family. Eventually, earnings from the telegraph made Morse extremely wealthy.

Drawing Conclusions What motivated Morse to invent the telegraph?



The telegraph grew with the railroad. Telegraph companies strung their wires on poles along railroads across the country. They established telegraph offices in many train stations. Thousands of miles of telegraph line were added every year in the 1850s. The first transcontinental line was finished in 1861. By the time he died in 1872, Morse was famous across the United States.

READING CHECK Identifying Cause and Effect

What event led to the widespread use of the telegraph, and what effect did the telegraph have on cross-country communications?

1837 John Deere invents the steel plow. The tough prairie sod can be cut and the thick soil ploughed without having to constantly clean the plow.



Steam Power and New Factories

At the start of the Industrial Revolution, most factories ran on waterpower. In time, however, factory owners began using steam power. This shift brought major changes to the nation's industries. Water-powered factories had to be built near streams or waterfalls. In contrast, steam power allowed business owners to build factories almost anywhere. Yet the Northeast was still home to most of the nation's industry. By 1860 New England alone had as many factories as the entire South did.

Some companies decided to build their factories closer to cities and transportation centers. This provided easier access to workers, allowing businesses to lower wages. Being closer to cities also reduced shipping costs. Cities soon became the center of industrial growth. People from rural areas as well as foreign countries flocked to the cities for factory jobs.

Factory workers improved the designs of many kinds of machines. Mechanics invented tools that could cut and shape metal, stone, and wood with great precision. By the 1840s this new machinery was able to produce interchangeable parts. Within a short period of time, the growing machine-tool industry was even making customized equipment.

READING CHECK Finding Main Ideas

What changes resulted from the shift to steam power?

Improved Farm Equipment

During the 1830s, technology began transforming the farm as well as the factory. In 1837 blacksmith **John Deere** saw that friends in Illinois had difficulty plowing thick soil with iron plows. He thought a steel blade might work better. His design for a steel plow was a success. By 1846 Deere was selling 1,000 plows per year.

In 1831 **Cyrus McCormick** developed a new harvesting machine, the mechanical reaper, which quickly and efficiently cut down wheat. He began mass producing his reapers in a Chicago factory. McCormick used new methods to encourage sales. His company advertised, gave demonstrations, and provided a repair and spare parts department. He also let customers buy on credit.

The combination of Deere's plow and McCormick's reaper allowed Midwestern farmers to plant and harvest huge crop fields. By 1860, U.S. farmers were producing more than 170 million bushels of wheat and more than 800 million bushels of corn per year.

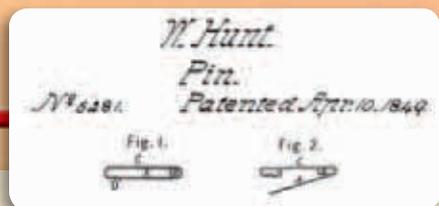
READING CHECK Summarizing What marketing methods did McCormick use to help sell his farm equipment?



1851 Isaac Singer improves the sewing machine. The production and repair of clothing becomes much easier.

American Inventions (continued)

1849 Walter Hunt invents the safety pin.



UNITED STATES PATENT OFFICE.

WALTER HUNT, OF NEW YORK, N. Y., ASSIGNOR TO WM. RICHARDSON AND JNO. RICHARDSON.

DRESS-PIN.

Specification of Letters Patent No. 6,981, dated April 10, 1849.

To all whom it may concern:

Be it known that I, WALTER HUNT, of the city, county, and State of New York, have invented a new and useful Improvement in the Make or Form of Dress-Pins, of which the following is a faithful and accurate description.

to the bar C, (see Figs. 6, 7 and 8,) which combined with the advantages of the spring and catch, renders it equally ornamental, and at the same time more secure and durable than any other plan of a clasp pin, heretofore in use, there being no joint to break or pivot to wear or get loose as in other plans. Another great advantage unknown in other

Changing Life at Home

Many inventions of the Industrial Revolution simply made life easier. When Alexis de Tocqueville of France visited the United States in the early 1830s, he identified what he called a very American quality.

“[Americans want] to be always making life more comfortable and convenient, to avoid trouble, and to satisfy the smallest wants [desires] without effort and almost without cost.”

—Alexis de Tocqueville, from *Democracy in America*

The sewing machine was one of these conveniences. Elias Howe, a factory apprentice in Lowell, Massachusetts, first invented it. **Isaac Singer** then made improvements to Howe’s design. Like McCormick, Singer allowed customers to buy his machines on credit and provided service. By 1860 Singer’s company was the world’s largest maker of sewing machines.

Other advances improved on everyday items. In the 1830s, iceboxes cooled by large blocks of ice became available. Iceboxes stored fresh food safely for longer periods. Iron cookstoves began replacing cooking fires and stone hearths.

Companies also began to mass produce earlier inventions. This allowed many families to buy household items, such as clocks, that they could not afford in the past. For example, a clock that cost \$50 in 1800 was selling for only \$1.50 by the 1850s. Additional useful items created during this period

include matches introduced in the 1830s, and the safety pin, invented in 1849. All of these inventions helped make life at home more convenient for an increasing number of Americans.

READING CHECK Analyzing How did labor-saving inventions affect daily life?

THE IMPACT TODAY

New inventions, such as cell phones, laptop computers, and microwave ovens, continue to make life easier and more convenient for people today.

SUMMARY AND PREVIEW New machines and inventions changed the way Americans lived and did business in the early 1800s. In the next section you will learn how agricultural changes affected the South.

Section 4 Assessment

go.hrw.com
Online Quiz

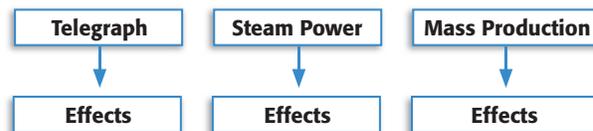
KEYWORD: SS8 HP11

Reviewing Ideas, Terms, and People HSS 8.6.1

- Describe** How did the **telegraph** work?
 - Predict** What impact might the telegraph have on the future of the United States?
- Describe** How did waterpowered factories differ from steam-powered factories?
 - Explain** How did the shift to steam power lead to the growth of cities?
- Identify** What contributions did **Cyrus McCormick** and **John Deere** make to farming?
 - Analyze** What effect did new inventions have on agriculture in the United States?
- Identify** What inventions improved life at home?
 - Evaluate** Which invention do you think had the greatest effect on the daily lives of Americans? Why?

Critical Thinking

- Identifying Cause and Effect** Copy the diagram below. Use it to show the effects that new advances had on the United States.



FOCUS ON WRITING

- Describing Technological Advances** Add notes about the inventions mentioned in this section to your chart. Think about which invention you will use for your newspaper advertisement.

1859 Manufactured goods become more valuable than agricultural goods in the country’s economy for the first time. The United States is becoming a modern industrial nation.

ANALYSIS SKILL

READING TIME LINES

Which two inventions improved American agriculture?

Social Studies Skills

Analysis

Critical Thinking

Participation

Study



HSS Participation Develop social and political participation skills.

Personal Conviction and Bias

Define the Skill

Everyone has *convictions*, or firmly-held beliefs. However, when we let our beliefs automatically slant or shape our point of view on topics, we may be showing bias. *Bias* is a fixed idea or opinion about someone or something. Some bias is based on a set of ideas about a group to which the person or thing belongs. This type of bias is called a *stereotype*. If the group is defined by race, religion, age, gender, or similar characteristics, the bias is known as *prejudice*.

Bias, stereotypes, and prejudice are not always negative in nature. They include favorable opinions too. For example, the belief that a student is good at math because that person is male is a bias that shows both stereotyping and prejudice.

We should always be on guard for the presence of personal bias. Eliminating stereotyping and prejudice is particularly important. However, even “good” biases can slant how we view, judge, and communicate information. Honest and accurate communication requires that the information and ideas we express be as free of bias as possible.

Learn the Skill

Not all beliefs are biases, even if those beliefs are strongly held. Biases are beliefs that have little or no evidence to support them. The more unreasonable a person’s view is in light of facts and evidence, the more likely it is that the belief is a bias.

Another characteristic of bias is the person’s reluctance to question his or her belief if it is challenged by evidence. Sometimes people stubbornly cling to views that overwhelming evidence proves wrong. This is why bias is defined as a “fixed” idea

or opinion. One of the most damaging effects of bias, and a good reason for trying to avoid it, is that it can prevent us from learning new things.

The following precautions can help you to reduce the amount of bias you hold and express.

- 1 When discussing a topic, keep in mind beliefs and experiences in your own background that might affect how you feel about the topic.
- 2 Try to not mix statements of fact with statements of opinion. Clearly separate and indicate what you *know* to be true from what you *believe* to be true.
- 3 Avoid using emotional, positive, or negative words when communicating factual information.

Practice the Skill

In 1834 Tennessee congressman Davy Crockett visited the textile mills at Lowell, Massachusetts. Read his account of the “Lowell girls” who worked in the factory and complete the activity below.

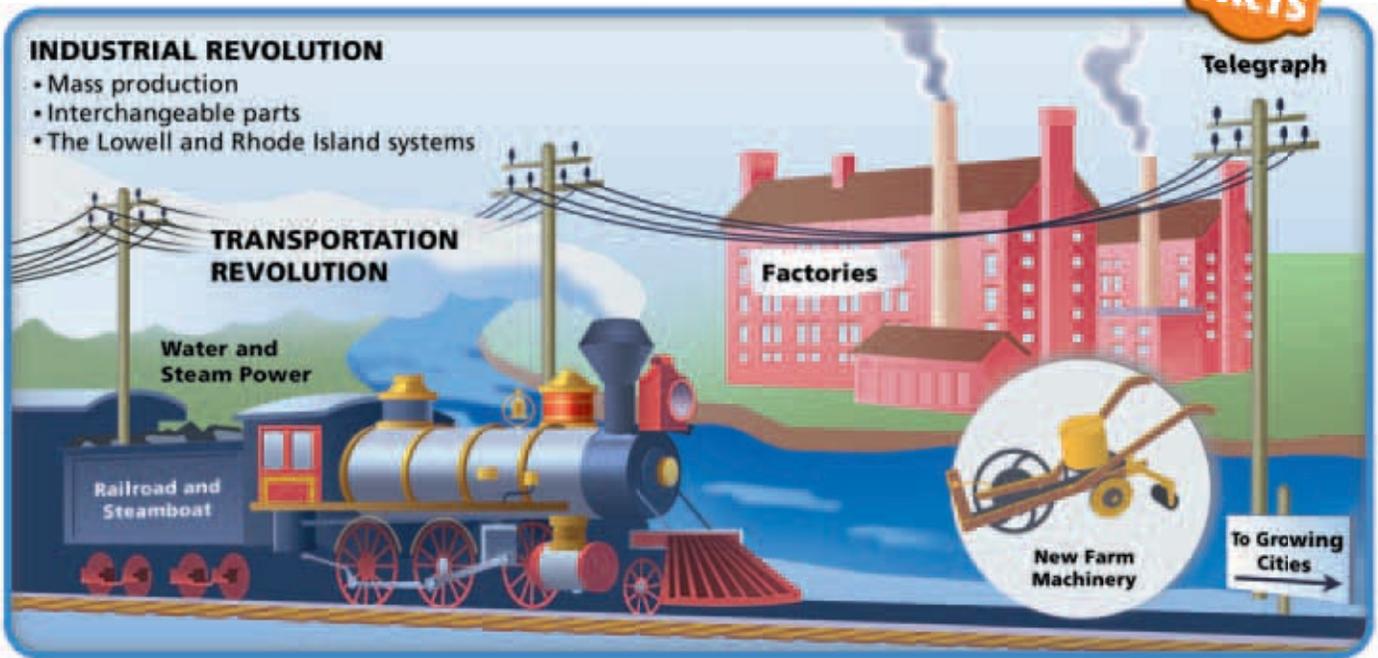
“Here are thousands [of young women], useful to others, ... with the prospect before them of future comfort and respectability ... There are more than five thousand females employed in Lowell; and when you come to see the amount of labour performed by them, in superintending [operating] the different machinery, you will be astonished.”

Suppose that you were a “Lowell girl” who has just read this account of Crockett’s visit. Write a letter to the editor of the *Lowell Offering* reacting to the biases and stereotypes about women that Crockett shows in his account.

Standards Review

Visual
Summary

Use the visual summary below to help you review the main ideas of the chapter.

Reviewing Vocabulary,
Terms, and People

Complete each sentence below by filling in the blank with the correct term or person from the chapter.

1. The system of _____ was developed to represent letters of the alphabet when sending telegraph messages.
2. The first American woman to hold a high-ranking position in the labor movement was _____.
3. The _____ was a period of rapid growth in the use of machines and manufacturing.
4. The first locomotive in the United States was built by _____.
5. Workers would sometimes go on _____ to force factory owners to meet their demands for better pay and working conditions.
6. The _____ industry, which produced cloth items, was the first to use machines for manufacturing.

Comprehension and
Critical Thinking**SECTION 1** (Pages 346–351) **HSS 8.6.1**

7. **a. Identify** What ideas did Eli Whitney want to apply to the manufacture of guns?
- b. Analyze** How did the War of 1812 lead to a boom in manufacturing in the United States?
- c. Elaborate** Why do you think the Industrial Revolution began in Great Britain rather than in the United States?

SECTION 2 (Pages 352–357) **HSS 8.6.1**

8. **a. Describe** What was mill life like?
- b. Draw Conclusions** How did the Rhode Island system and the Lowell system change the lives of American workers?
- c. Evaluate** Were reformers such as Sarah G. Bagley effective in improving labor conditions? Why?

SECTION 3 (Pages 358–363) HSS 8.6.1

9. a. **Describe** How were Americans affected by the introduction of steamboats?
- b. **Make Inferences** How did railroad companies become some of the most powerful businesses in the country?
- c. **Elaborate** In your opinion, what was the most important result of the Transportation Revolution?

SECTION 4 (Pages 364–367) HSS 8.6.1

10. a. **Recall** What important change took place in how factories were powered?
- b. **Draw Conclusions** How did the telegraph affect communication in the United States?
- c. **Evaluate** Do you think moving factories close to cities helped or hurt working life? Explain.

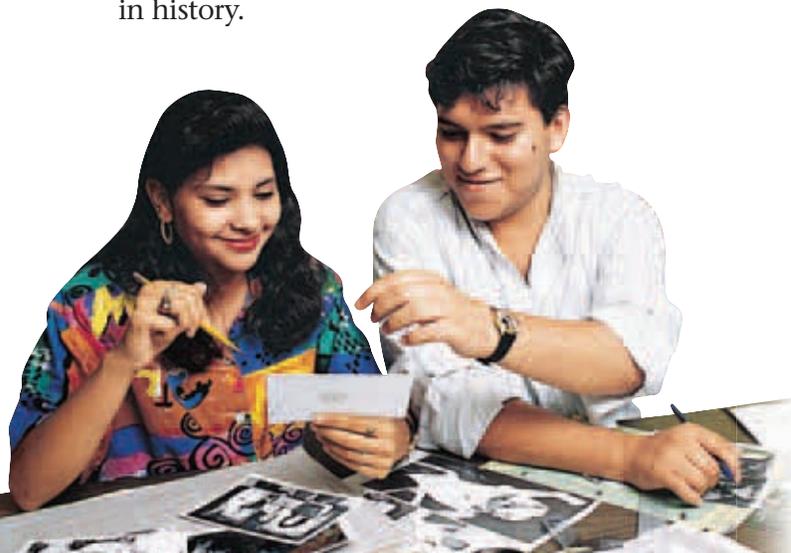
Reviewing Themes

11. **Science and Technology** Rank what you think are the three most important inventions of the Industrial Revolution. Explain your choices.
12. **Economics** What was the overall effect of the Industrial Revolution on the U.S. economy?

Using the Internet

go.hrw.com
KEYWORD: SS8 US11

13. **Activity: Advertisement** The Industrial Revolution changed the way goods were produced. New inventions created easier, faster, or completely new ways of doing things. Enter the activity keyword and research inventions made between 1790 and 1860. Then create an advertisement for one of the inventions that might have appeared in a magazine during that time in history.



Reading Skills

Understanding Cause and Effect Structure Use the Reading Skills taught in this chapter to answer the question about the reading selection below.

Many young women came to Lowell from across New England. They wanted the chance to earn money instead of working on the family farm. (p. 354)

14. According to the passage above, what was a cause for moving to Lowell?
 - a. working long hours
 - b. earning money
 - c. meeting people
 - d. working on a farm

Social Studies Skills

Personal Conviction and Bias Use the Social Studies Skills taught in this chapter to answer the question about the reading selection below.

“Is anyone such a fool as to suppose that out of six thousand factory girls in Lowell, sixty would be there if they could help it?”

—Sarah G. Bagley, quoted in *The Belles of New England*
by William Moran

15. Do you think that Bagley’s opposition to the Lowell system was unfairly biased? Why or why not?

FOCUS ON WRITING



16. **Writing Your Newspaper Advertisement** Look over your chart, and choose one invention for your advertisement. Then answer these questions to help you plan your advertisement: Who is your audience? Who will buy this invention? How will the invention benefit this audience? What words or phrases will best persuade this audience? Once you have answered these questions, design your advertisement. To draw readers’ attention to your ad, include an illustration, a catchy heading, and a few lines of text.

Standards Assessment

DIRECTIONS: Read each question and write the letter of the best response.

1

“The little money I could earn—one dollar a week, besides the price of my board—was needed in the family, and I must return [from home] to the mill . . . I began to reflect on life rather seriously for a girl of twelve or thirteen. What was I here for? What would I make of myself? . . . We did not forget that we were working girls . . . clearing away a few weeds from the overgrown track of independent labor for other women . . . [so that] no real odium [disrespect] could be attached to any honest toil that any self-respecting woman might undertake.”

—from *A New England Girlhood* by
Lucy Larcom (1824–1893)

From the content of this passage, you can determine that the writer was commenting about

- A the mass-production system.
 - B the Lowell system.
 - C the Rhode Island system.
 - D the trade union system.
- 2 The first machines of the Industrial Revolution were powered by
- A electricity.
 - B water.
 - C animals.
 - D coal.
- 3 The earliest important evidence of the Industrial Revolution in America was found in
- A the way cotton was processed for market.
 - B the production of tobacco products.
 - C the manufacture of cloth and thread.
 - D the construction of the first steam railroads.

- 4 The Transportation Revolution of the mid-1800s had all of the following effects *except*
- A reducing the time and cost of shipping products.
 - B helping to create a boom in business and agriculture across the nation.
 - C making travel upstream on rivers faster and easier.
 - D limiting the federal government’s ability to control trade among states.
- 5 What change in technology allowed business owners to sell their goods in markets across the country?
- A the Lowell system
 - B the growth of railroads
 - C the invention of the telegraph
 - D the Arkwright system

Connecting with Past Learning

- 6 Which inventor’s contribution that you learned about in Grade 7 changed the world in much the same way that Samuel F. B. Morse’s invention changed it during the Industrial Revolution?
- A Marco Polo
 - B Archimedes
 - C Johannes Gutenberg
 - D Sir Isaac Newton
- 7 The economic growth and change that the Industrial and Transportation revolutions brought to America were *most* like earlier economic changes that occurred in
- A Japan.
 - B India.
 - C Africa.
 - D England and Holland.