

# Early Industry and Inventions

## One American's Story

Harriet Hanson Robinson began working in the textile mills in Lowell, Massachusetts, in 1835, when she was ten years old. At the time, there were few opportunities for girls and women to work outside the home, and Harriet was proud to earn a good wage. As an adult, Harriet described the life of the mill girls.

### PRIMARY SOURCE

“ Though the hours of labor were long, they were not overworked; they were obliged to tend no more looms and frames than they could easily take care of, and they had plenty of time to sit and rest. . . . They were treated with consideration by their employers, and there was a feeling of respectful equality between them. . . . In those days, there was no need of advocating the doctrine of the proper relation between employer and employed. *Help was too valuable to be ill-treated.* ”

—Harriet Hanson Robinson, from *Loom and Spindle; or, Life Among the Early Mill Girls*

Later, when laborers were more plentiful, the mill owners were able to cut wages, and life in the mills became much more difficult.

## The Industrial Revolution

▼ **KEY QUESTION** How did the Industrial Revolution change the way Americans lived and worked?

After the War of 1812, Americans experienced a new kind of revolution. This was not a political revolution, but a change in the way that goods were produced. For centuries, people had made clothing, furniture, and other goods at home. Then, in late-18th-century Britain, factory machines started replacing hand tools. Soon large-scale manufacturing was producing huge quantities of goods. These changes are called the **Industrial Revolution**.



The textile industry employed young workers such as this unidentified mill girl, photographed holding a spindle (for spinning fibers).

## Connect to the World

### Child Labor

In the late 1700s, the majority of workers in British textile factories were children. Their small, agile fingers were considered well-suited to textile work. Children as young as four years old might work 12 to 16 hours a day.

### ONLINE PRIMARY SOURCE

Hear the perspectives at the Research & Writing Center @ ClassZone.com

**Factories Rise in New England** In America, the Industrial Revolution began in 1793, when the Englishman **Samuel Slater** built the first spinning mill in Pawtucket, Rhode Island. The year before, he had sailed to the United States, perhaps under a false name—it was illegal for British textile workers to leave the country. Britain did not want another nation to copy its machines for making thread and cloth. But Slater brought the secrets to America.

At first, Slater hired a small group of children and paid them a low wage. Later, he built a larger mill and employed whole families. As Slater influenced others to start mills, his family system of employment spread through Rhode Island, Connecticut, and southern Massachusetts.

New England was a good place to build factories. The mills needed water power, and New England had many fast-moving rivers. For transportation, it had ships and access to the ocean. The region also had a ready labor force of farmers who were tired of scraping together a living from stony fields.

The **factory system** brought many workers and machines together under one roof. People left their family farms and crowded into cities to take jobs in factories. They worked for wages on a set schedule. Their way of life changed—and not always for the better.

## COMPARING Perspectives

### LIFE IN THE MILLS

The Industrial Revolution swept England in the mid-1700s. Half a century later, America, too, began to be transformed from a land of small farmers to an industrial nation. In these excerpts, observers from America and England described what they saw on visits to America's then-new Lowell mills.

#### An American Speaks

“The din and clatter of these five hundred looms under full operation, struck us . . . as something frightful and infernal . . . The atmosphere of such a room . . . is charged with cotton filaments and dust, which, we were told, are very injurious to the lungs. On entering the room, although the day was warm, we remarked that the windows were down . . . [W]e found ourselves . . . in quite a perspiration . . .”

—*A Description of Factory Life by an Associationist*, 1846

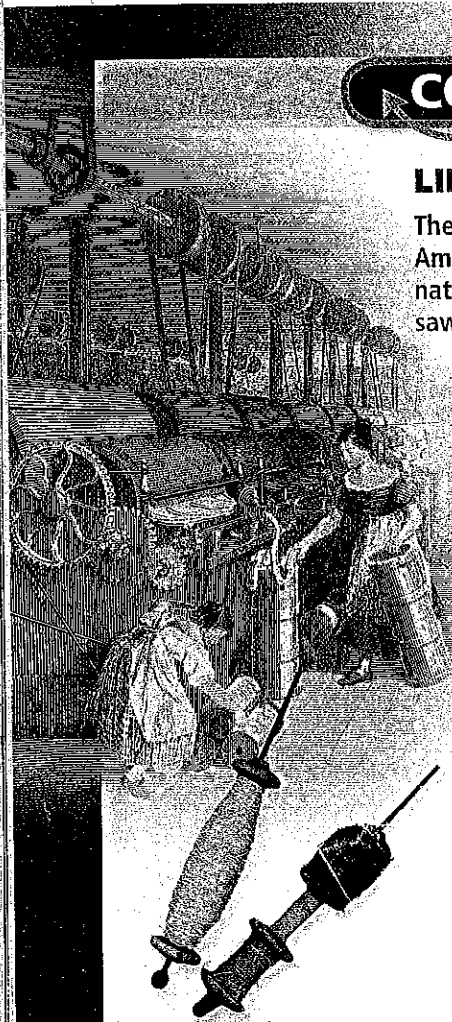
#### An Englishman Speaks

“The rooms in which [the girls] worked were as well ordered as themselves. In the windows of some, there were green plants, which were trained to shade the glass; in all, there was as much fresh air, cleanliness, and comfort, as the nature of the occupation would possibly admit of. . . I solemnly declare, that from all the crowd I saw . . . I cannot recall . . . one young face that gave me a painful impression . . .”

—*Charles Dickens, American Notes*, 1842

### CRITICAL THINKING

1. **Make Inferences** What do you think working conditions were like in the mills in England?
2. **Recognizing Bias and Propaganda** Why might the two writers describe the same working conditions in such different ways?



Many Americans, such as Thomas Jefferson, did not want the United States to industrialize. But the War of 1812 brought growth to American industry. Because the British naval blockade kept imported goods from reaching U.S. shores, Americans had to manufacture their own goods. The blockade also stopped investors from spending money on shipping and trade. Instead, they invested in new American industries. Entrepreneurs built factories, starting in New England. These entrepreneurs and their region grew wealthier.

**The Lowell Mills Hire Women** In 1814, the U.S. textile industry took a leap forward when Francis Cabot Lowell built a factory in eastern Massachusetts. This factory spun raw cotton into yarn, and then wove the yarn into cloth on power looms. Lowell had seen power looms in English mills and had figured out how to build them.

The factory was so successful that Lowell's associates built a new factory town, Lowell, near the Merrimack and Concord rivers. The **Lowell mills**, textile mills in the town, brought another significant change as large numbers of women entered the workforce. Many were farm girls who lived in company-owned boardinghouses. In the early years, the Lowell girls' wages were high—between two and four dollars a week. Older women supervised the girls. Later, falling profits meant that wages dropped and working conditions worsened at the Lowell mills.

The Lowell mills and other early factories ran on water power. Factories built after the 1830s were run by more powerful steam engines. Because steam engines used coal and wood, not fast-moving water, these newer factories could be built away from rivers and beyond New England.

**New Manufacturing Methods Spread** New manufacturing methods changed work in other industries as well. In 1797, the U.S. government hired the inventor Eli Whitney to make 10,000 muskets for the army. Before this time, guns were made one at a time by a gunsmith. Each gun differed slightly. If a part broke, a new part had to be created to match the broken one.

Whitney sought a better way to make guns. In 1801, he went to Washington and laid out several piles of musket parts. He took a part from each pile and quickly assembled a musket. He had just demonstrated the use of interchangeable parts—parts that are exactly alike.

Machines that produced identical parts soon became standard. Interchangeable parts speeded up production, made repairs easy, and allowed the use of less-skilled workers.

**SYNTHESIZE** Describe how the Industrial Revolution changed the way Americans lived and worked.

## Time Table of the Holyoke Mills,

To take effect on and after Jan. 3d, 1853.

The standard being that of the Western Rail Road, which is the Meridian time at Cambridge.

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**MORNING BELLS.**

First Bell ring at 4:40, A. M. Second Bell ring in at 5, A. M.

**YARD GATES**

Will be opened at ringing of Morning Bells, of Meal Bells, and of Evening Bells, and kept open ten minutes.

**WORK COMMENCES**

At ten minutes after last Morning Bell, and ten minutes after Bell which "rings in" from Meals.

**BREAKFAST BELLS.**

October 1st, to March 31st, inclusive, ring out at 7, A. M.; ring in at 7:30, A. M.  
April 1st, to Sept. 30th, inclusive, ring out at 6:30, A. M.; ring in at 7, A. M.

**DINNER BELLS.**

Ring out at 12:30, P. M.; ring in at 1, P. M.

**EVENING BELLS.**

Ring out at 6:30, P. M.

\* Excepting on Saturdays when the Sun sets previous to 6:30. At such times, ring out at Sunset.

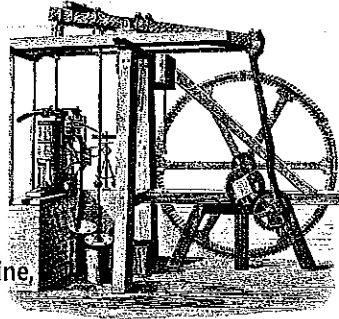
In all cases, the first stroke of the Bell is considered as marking the time.

Work at the early mills was guided by a bell schedule such as this one, which begins with a wake-up bell at 4:40 in the morning. What does this schedule tell you about the workers' daily lives?

## TECHNOLOGY of the TIME

1765

- ▶ 1769 Improved Steam engine, James Watt



- c. 1786 Threshing machine, Andrew Meikle

- 1793 Cotton gin, Eli Whitney



- ▲ c. 1803 Locomotive, Richard Trevithick



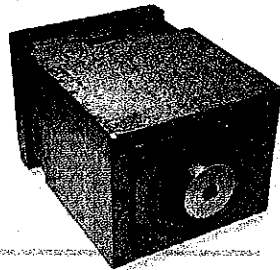
- ◀ 1807 Steamboat, Robert Fulton

- 1834 Reaper, Cyrus McCormick

- 1837 Telegraph, Samuel F. B. Morse
- Steel plow, John Deere

- 1839 Photography, Louis Daguerre

1845



**CRITICAL THINKING** Evaluate Which of these inventions do you think had the greatest impact on life in the middle of the 19th century?

## New Inventions Improve Life

▼ **KEY QUESTION** How did new inventions improve American life?

New inventions improved transportation, communication, and production. They also quickened the pace of life.

**Transportation and Communication** Inventor Robert Fulton developed a steamboat that could move against the current or a strong wind. He launched the *Clermont* on the Hudson River in 1807. Its steam engine turned two side paddle wheels, which pulled the boat through the water. Many thought it looked silly and nicknamed it "Fulton's Folly," but it made the 300-mile round-trip from New York to Albany and back in a record 62 hours.

In 1811, a steamship first traveled down the Ohio and Mississippi rivers. However, its engine was not powerful enough to return upriver against the current. Henry Miller Shreve, a trader on the Mississippi, designed a steamship that could be powered up the Mississippi, against the current. In 1816, his boat launched a new era of transportation on the river.

Some cities, however, were not on rivers that could be navigated by steamship. Traders in these cities needed a way to ship goods. Steam-powered trains were the answer. English engineer Richard Trevithick had introduced the locomotive around 1803. In 1830, Peter Cooper built America's first successful steam-powered locomotive, called the *Tom Thumb*. By 1833, the 136-mile railroad track connecting Charleston and Hamburg, South Carolina, was the longest in the world.

Around 1837, Samuel F. B. Morse first demonstrated his telegraph. This machine sent long and short pulses of electricity along a wire. These pulses could be translated into letters spelling out messages. With the telegraph, it took only seconds to communicate with someone in another city. In 1844, the first long-distance telegraph line carried news from Baltimore to Washington, D.C., about who had been nominated for president. Telegraph lines spanned the country by 1861, bringing people closer as a nation.

**Technology Improves Farming** Other new inventions increased farm production. In 1837, blacksmith John Deere invented a lightweight plow with a steel cutting edge. Older cast-iron plows were designed for the relatively light and sandy soil of New England. But rich, heavy Midwestern soil clung to the bottom of these plows and slowed down farm work. Deere's new plow made preparing ground to plant crops much less work. As a result, more farmers began to move to the Midwest.

The **threshing machine** and the **mechanical reaper** were other inventions that improved agricultural production by making farm work quicker and more efficient. The threshing machine, which was invented around 1786 by Andrew Meikle of Scotland, mechanically separated kernels of wheat from husks. In 1831, Cyrus McCormick developed a reaper that cut ripe grain quickly and efficiently. McCormick patented his invention in 1834 and brought it to Europe in the 1850s.

New technologies linked regions and contributed to a feeling of national unity. With new farm equipment, Midwestern farmers grew food to feed Northeastern factory workers. In turn, Midwestern farmers became a market for Northeastern manufactured goods. The growth of Northeastern textile mills increased demand for Southern cotton, which, unfortunately, led to the expansion of slavery in the South.

▲ **MAIN IDEAS & DETAILS** Explain how new inventions improved American life.

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## Section Assessment



### ONLINE QUIZ

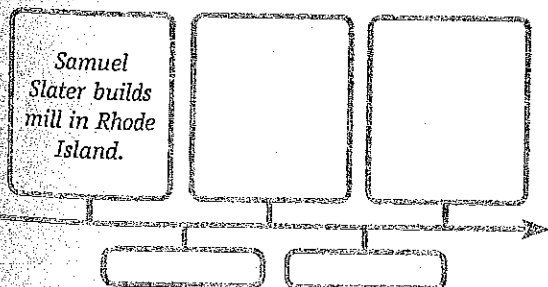
For test practice, go to  
Interactive Review @ ClassZone.com

### TERMS & NAMES

- Explain the importance of
  - Industrial Revolution
  - Robert Fulton
  - Samuel Slater
  - Peter Cooper
  - factory system
  - Samuel F. B. Morse
  - Lowell mills

### USING YOUR READING NOTES

- Sequence Events** Complete the diagram you started at the beginning of this section.



### KEY IDEAS

- Why was New England a good place to set up factories?
- How were different regions of the United States linked economically?

### CRITICAL THINKING

- Summarize** Explain how the use of interchangeable parts improved the manufacturing process.
- Form and Support Opinions** Samuel Slater and Francis Lowell both illegally brought industrial secrets to the United States. Do you think they were wrong to do this? Explain.
- At** Use the library to find an image of one of the early inventions mentioned in this section. Draw a detailed picture of it. Then write a paragraph explaining how the invention worked.