

## Vocabulary Builder

### Previewing High-Use Academic Words

High-Use Word	Definition	Sample History Sentence
<b>invest</b> (ihn VEHT) (Section 1, p. 383)	<b>v.</b> to supply money for a project in order to make a profit	Shipowners <u>invested</u> in voyages to distant lands.
<b>efficient</b> (ee FISH ehnt) (Section 1, p. 386)	<b>adj.</b> acting effectively, without wasted cost or effort	New inventions often led to more <u>efficient</u> ways of doing business.
<b>reign</b> (rayn) (Section 2, p. 393)	<b>n.</b> period of dominance or rule	The American Revolution took place during the <u>reign</u> of King George III.
<b>inferior</b> (ihn FIR ee uhr) (Section 2, p. 395)	<b>adj.</b> less worthy; less valuable; of lower rank	Old factories are <u>inferior</u> to newer, more modern ones.
<b>devote</b> (dee VOHT) (Section 3, p. 397)	<b>v.</b> to commit; to apply (time and energy, for example)	To become a judge, one must <u>devote</u> many years to the study of law.
<b>revolt</b> (ree VOHLT) (Section 3, p. 400)	<b>n.</b> uprising; rebellion	Slaveholders feared times when enslaved African Americans would rise up in <u>revolt</u> and fight for freedom.
<b>pursue</b> (per SYOO) (Section 4, p. 402)	<b>v.</b> to chase after; to try to capture	Latin American leaders vowed to <u>pursue</u> liberty in their fight for freedom from European control.
<b>isolated</b> (i sah lay tehnd) (Section 4, p. 403)	<b>adj.</b> set apart	Lord Cornwallis was trapped on the <u>isolated</u> Yorktown peninsula.

### Previewing Key Terms and People

**Industrial Revolution**, p. 382  
**factory system**, p. 383  
**capitalist**, p. 383  
**Francis Cabot Lowell**, p. 384  
**mass production**, p. 386  
**interchangeable parts**, p. 386  
**urbanization**, p. 390

**telegraph**, p. 391  
**Samuel F.B. Morse**, p. 391  
**famine**, p. 394  
**nativist**, p. 394  
**discrimination**, p. 395  
**cotton gin**, p. 396  
**slave code**, p. 399

**spiritual**, p. 400  
**Nat Turner**, p. 400  
**Daniel Boone**, p. 401  
**turnpike**, p. 402  
**corduroy road**, p. 403  
**canal**, p. 403  
**Henry Clay**, p. 404

Nat Turner





# The Industrial Revolution

## Objectives

1. Explain the changes that the Industrial Revolution brought to American life.
2. Discuss the importance of Samuel Slater's cotton mill.
3. Describe the growth of industry in the United States after 1812.
4. Identify important developments in factories and the problems that factory life produced.

## Main Idea

The Industrial Revolution introduced great changes in the way Americans lived.

## Prepare to Read

### Reading Skill

**Identify Central Issues From the Past** To effectively study history, you can identify important—or central—issues and then seek to make generalizations from them. To make a generalization, identify main points or ideas in a text. Then, devise a general principle or broad statement that applies to all of them and to other situations.

## Vocabulary Builder

### High-Use Words

**invest**, p. 383

**efficient**, p. 386

### Key Terms and People

**Industrial Revolution**, p. 382

**factory system**, p. 383

**capitalist**, p. 383

**Francis Cabot Lowell**, p. 384

**mass production**, p. 386

**interchangeable parts**, p. 386

**★ Background Knowledge** In the early 1700s, most people worked as farmers. Men worked in the fields to produce food for their families. Women helped in the fields and made simple goods, like candles and soap, at home. In this section, you will see how new inventions began to change the way people lived and worked.

## A Revolution in Technology

In the 1700s, a great change began that we now call the **Industrial Revolution**. Gradually, machines took the place of many hand tools. Much of the power once provided by people and horses began to be replaced, first by flowing water and then by steam engines.

The Industrial Revolution began in Britain, in the textile, or cloth-making, industry. For centuries, workers had spun thread in their homes on spinning wheels. The thread was then woven into cloth on hand looms. Making thread was time-consuming. It took one person, spinning one strand at a time, almost two weeks to produce a pound of cotton thread.

**Machines and Factories** In the 1760s, the spinning jenny speeded up the thread-making process. The jenny allowed a person to spin many strands at once. However, thread still had to be made by hand.

Then, in 1764, Richard Arkwright invented the water frame, a spinning machine powered by running water rather than human energy. Other inventions speeded up the weaving process. To house the large machines, manufacturers built textile mills on the banks of rivers.

The new mills created a new way of working, known as the factory system. The **factory system brings workers and machinery together in one place**. Instead of spinning at home, textile workers had to go to the factories and begin and end work at specific hours. Workers now had to keep up with the machines instead of working at their own pace.

British mill owners soon recognized the potential of the new water frames and the factory system. However, the system required huge amounts of money to be **invested** in buildings and machines. Thus, the mill owners turned to **capitalists, people who invest capital, or money, in a business to earn a profit**. Factories proved to be a good investment for the capitalists and mill owners. By 1784, British workers were producing 24 times as much thread as they had in 1765.

**Steam Power** Building factories on riverbanks had some disadvantages. In a dry season, the machines had no power. Also, most factories were far from cities, and labor was hard to find in rural areas.

In 1790, Arkwright built the first steam-powered textile plant. The steam engine was a reliable source of power. Factories no longer had to be built on riverbanks. They could be built in cities, where young women and children provided cheap labor.

Britain tried to guard the secrets of its industrial success. It forbade anyone to take information about textile machinery out of Britain. Skilled workers were forbidden to leave the country.

**✓Checkpoint** How did the Industrial Revolution change the way work was performed?

### Vocabulary Builder

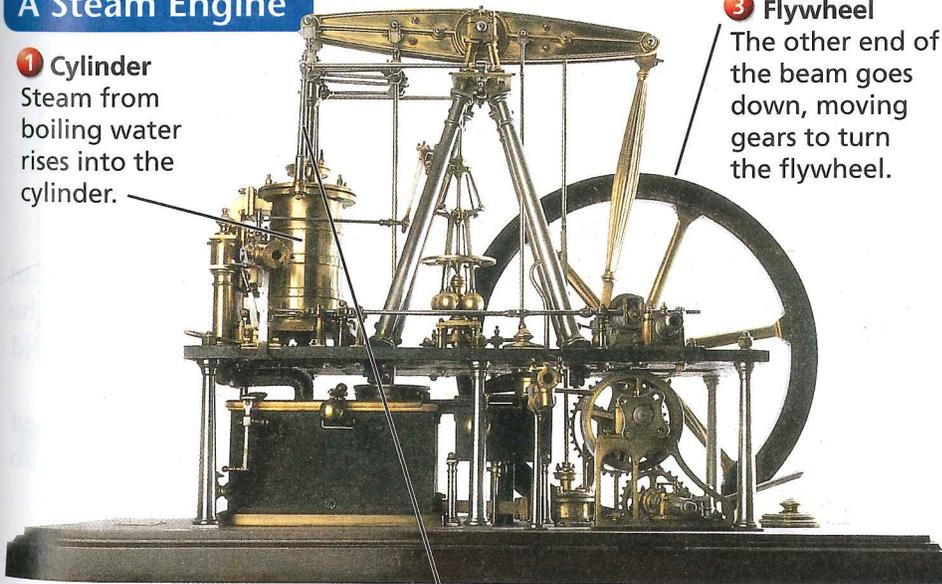
**invest** (ihN VEHST) v. to supply money for a project in order to make a profit

## A Steam Engine

**1 Cylinder**  
Steam from boiling water rises into the cylinder.

**3 Flywheel**  
The other end of the beam goes down, moving gears to turn the flywheel.

**2 Piston rod** Pressure from the rising steam pushes the piston rod up and raises one end of the beam.



## History Interactive

### Steam Engine in Action

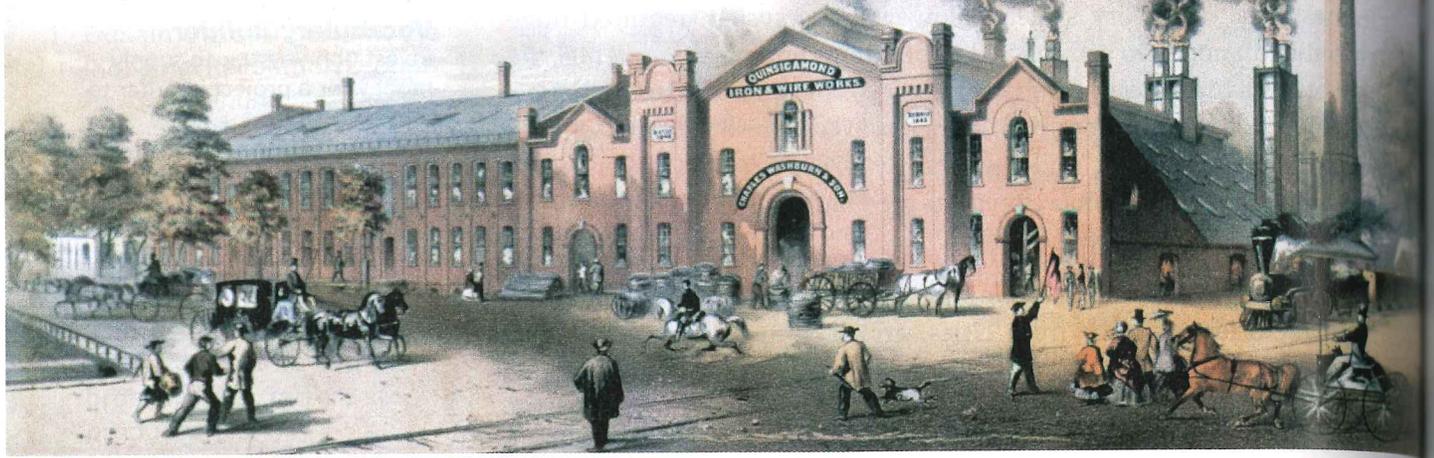
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### Steam Engine

Steam engines use the energy created by boiling water to push rods and wheels. **Critical Thinking: Identify Economic Benefits** What advantage would the steam engine have given to a manufacturer over competitors who depended on water power to operate their machinery?

## Signs of Progress

The Industrial Revolution put people to work in large factories like the one shown here. **Critical Thinking: Distinguish Relevant Information** From the evidence in this picture, how might the presence of a factory affect the surrounding communities?



### Main Idea

Britain tried but failed to prevent the spread of the new industrial methods.

### Main Idea

The factory system changed the way Americans worked and encouraged the growth of U.S. industry.

## The American Industrial Revolution

In 1789, a young apprentice in one of Arkwright's factories decided to immigrate to the United States. Samuel Slater knew that his knowledge of Arkwright's machines could be worth a fortune. He studied hard and memorized the plans of Arkwright's machines. Then, he boarded a ship for New York.

In the United States, Slater joined forces with a wealthy merchant, Moses Brown. Brown had rented a textile mill in Pawtucket, Rhode Island. Relying entirely on his memory, Slater constructed a spinning machine based on Arkwright's. Slater's factory began producing cotton thread at a rate never before seen in the United States.

**✓ Checkpoint** Why did Samuel Slater have to build his machines from memory?

## American Industry Grows

The success of Slater's mill marked the beginning of American industrialization. Industrialization began in the Northeast. The region was home to a class of merchants who had capital to build factories and to buy raw materials.

Still, U.S. industry did not grow significantly until the War of 1812. As the British navy blockaded U.S. ports, Americans had to depend on their own industries to supply goods.

**The Lowell Mills** Francis Cabot Lowell found a way. Before the war, he had visited England and seen the latest weaving machines. When he returned to the United States, Lowell and an associate built an improved version of the English machines.

With several other capitalists, Lowell opened a mill in Waltham, Massachusetts. The mill was organized in a new way. Instead of obtaining thread from separate spinning mills, Lowell's factory brought together spinning and weaving in one building.

After Lowell died in 1817, his partners expanded the business. Wanting better lives for their workers, the partners built a new town, with boardinghouses, a library, and a hospital. They named their mill town Lowell after their late partner.

**Lowell Girls** The new factories were staffed with young women from nearby farms. "Lowell girls" lived in boardinghouses under strict supervision. After work, they might attend lectures or visit libraries. As a result, many women gained an education they probably would not have received on their family farms. The British novelist Charles Dickens was amazed when he saw Lowell:

“Firstly, there is a . . . piano in a great many of the boardinghouses. Secondly, nearly all these young ladies subscribe to circulating libraries. Thirdly, they have [created] a periodical called 'The Lowell Offering.' . . .”

—Charles Dickens, *American Notes*, 1842



### Identify Central Issues From the Past

What generalization can you make about the link between war, trade, and inventiveness?

**Checkpoint** How was the Lowell factory system different from the European factory system?

## Links Across Time

### Technology and Work

**1820s** The Industrial Revolution opened the way for new developments in technology, which changed the way people worked.

**1981–2000s** Since the invention of the personal computer, changes in technology have affected not only *how* people work but also *where* they work. With speedy laptops and hand-held devices, workers are able to work successfully at home or at the office.

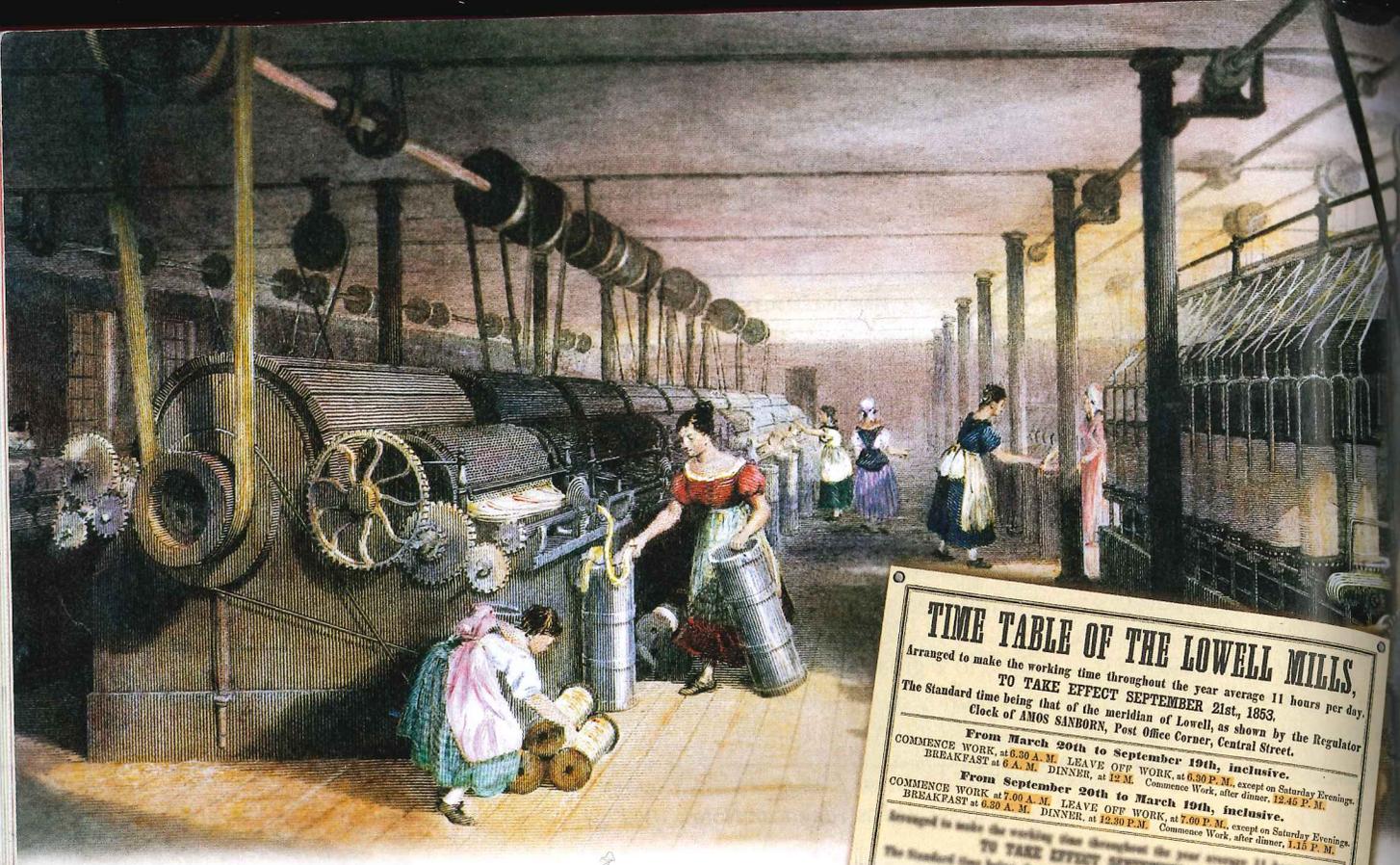
### Link to Today

**Technology's Impact** Technology continues to advance. How are technological innovations changing people's lives today?

**For:** Technology in the workplace  
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**2000s** Office workers and researchers use computers for much of what they do.





## Factory Workers

This picture shows young girls at work in a textile factory about 1834.

**Critical Thinking: Draw Conclusions** What were some disadvantages for children who worked in early American factories?



## Main Idea

American inventors developed new ways for factories to produce large amounts of goods quickly.

## The Revolution Takes Hold

The Lowell system was an example of a unique American outlook. Without a long tradition of doing things a certain way, Americans experimented with new methods. One of the most important developments was **mass production, or the rapid manufacture of large numbers of identical objects.**

Before the 1800s, skilled craftworkers manufactured clocks, guns, and other mechanical products. Each part of the gun or clock was handcrafted. When a part broke, a craftworker had to create a unique piece to fit the product. In the 1790s, American inventor Eli Whitney devised a system of **interchangeable parts, identical pieces that could be assembled quickly by unskilled workers.**

Interchangeable parts soon came to be used in the manufacture of other products. Manufacturing became more **efficient.** The price of many goods dropped. As people bought more goods, U.S. industry expanded to satisfy their needs.

## Vocabulary Builder

**efficient** (ee FISH ehnt) *adj.* acting effectively, without wasted cost or effort

**Factory Life** As you have read, the Lowell mills treated factory workers in a new and kinder way. However, this was not the general rule. Samuel Slater employed children in his textile mill, as had been done for decades in British factories. As time went on, working conditions for children and adults became harsher.

**Child Labor** Children routinely worked on family farms in the 1800s. Their labor was often needed to help feed their families. Working on a home farm was different from working in a factory, however. American textile mills, coal mines, and steel foundries employed children as young as 7 or 8. These children had no opportunities for education. They often worked in unsafe conditions. By 1880, more than a million children between the ages of 10 and 15 worked for pay.

**Factory Conditions** Working conditions were appalling. Factories were poorly lighted. There was little fresh air. Machines were designed to perform a task, not to protect the worker. As a result, many workers were injured on the job. A worker who lost a hand or a foot received no help. He or she needed to depend on family for support. Business owners provided no payments for disabled workers, as they do by law today.

To keep machines running as long as possible, workdays lasted 12 or 14 hours. By 1844, workers were demanding shorter days. "Eight hours for work, eight hours for sleep, and eight hours for God and the brethren" was an early slogan. Conditions gradually improved, but the 8-hour workday was far in the future.

 **Checkpoint** How did Eli Whitney's system of interchangeable parts speed up the manufacturing process?

 **Looking Back and Ahead** Although the new factories were hard on workers, industrialization led to vastly increased production and lower prices. In the next section, you will read how the growth of northern industry helped to widen the gap between the North and the South.

## Section 1 | Check Your Progress

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### Comprehension and Critical Thinking

- (a) **Describe** How did the War of 1812 affect U.S. industry?

(b) **Draw Conclusions** Why did advances in industry occur mainly in the North?
- (a) **Recall** What are interchangeable parts?

(b) **Draw Conclusions** How did the system of interchangeable parts affect employment in the United States?

### Reading Skill

- Identify Central Issues From the Past** Based on this section, what generalization can you make about the impact of inventiveness during the early Industrial Revolution?

### Vocabulary Builder

- Write two definitions for each key term: **factory system**, **capitalist**, **interchangeable parts**. First, write a formal definition for your teacher. Second, write a definition in everyday English for a classmate.

### Writing

- Rewrite the following lists of causes and effects, so that causes are correctly paired up with their effects.

**Causes:** Francis Lowell; Arkwright's textile plant; Samuel Slater's emigration; Eli Whitney

**Effects:** efficiency in mass production; libraries for factory workers; factories built in cities; increased American production of cotton thread