

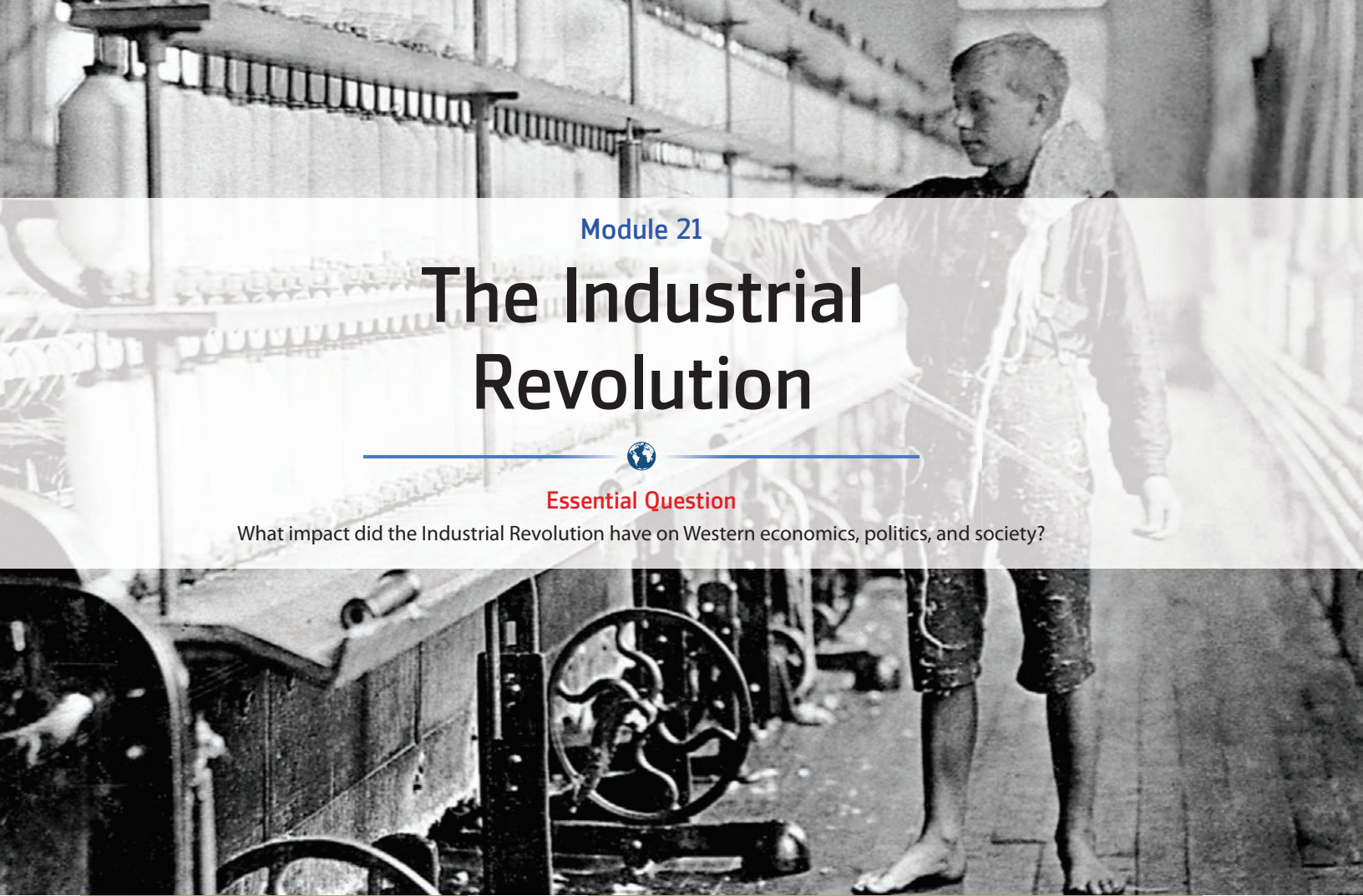
Module 21

The Industrial Revolution



Essential Question

What impact did the Industrial Revolution have on Western economics, politics, and society?



About the Photo: During the Industrial Revolution, there was such a demand for cheap labor that children were put to work in factories. Long hours and dangerous working conditions would eventually lead to demands for reform.

In this chapter you will learn about the key events of the Industrial Revolution and discover how the revolution affected economics and politics.

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VIDEOS, including...

- The Industrial Revolution
- Rockefeller's Standard Oil
- J.P. Morgan vs. the Coal Miners

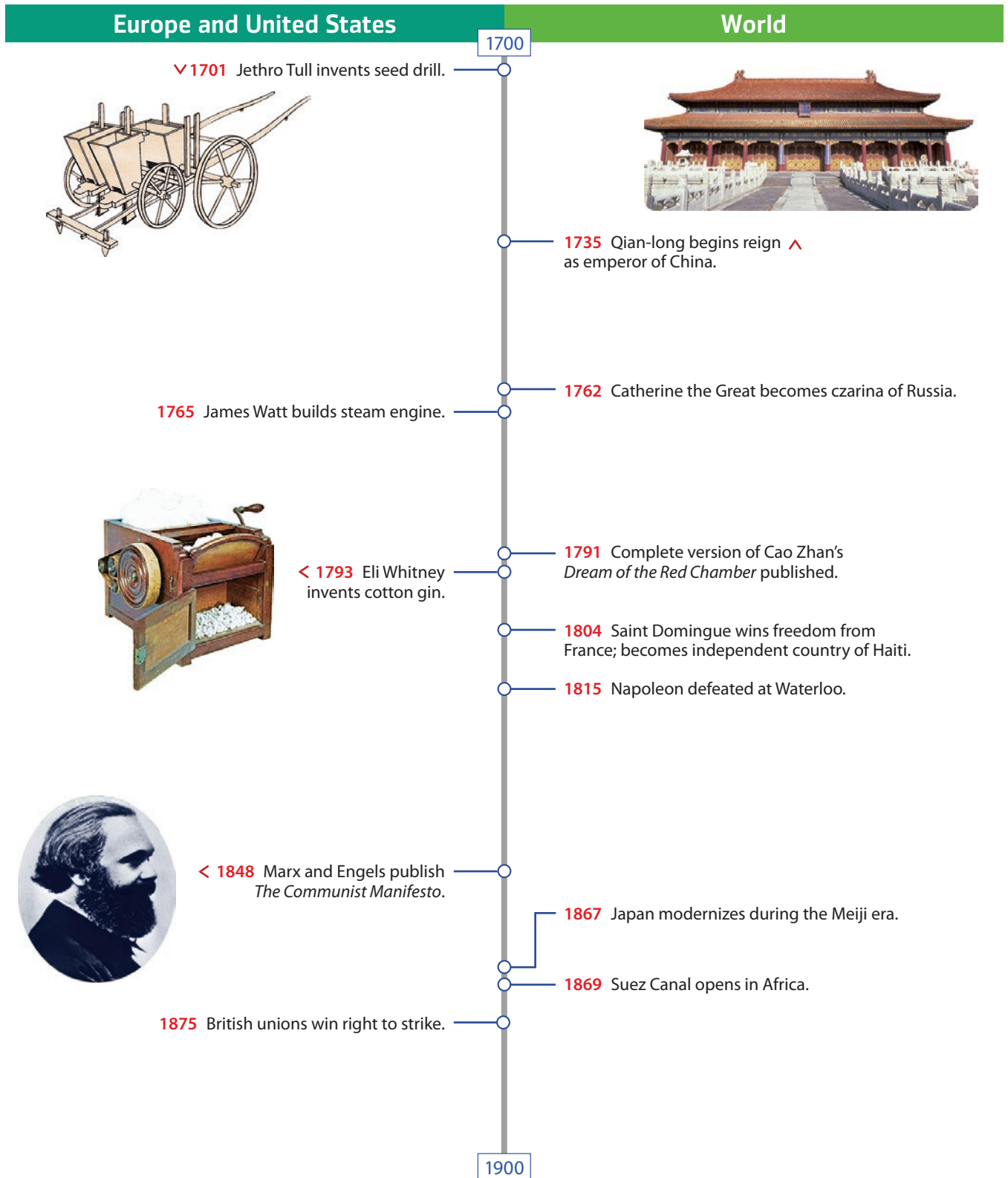
- ✓ Document-Based Investigations
- ✓ Graphic Organizers
- ✓ Interactive Games
- ✓ Carousel: Revolutions in Technology
- ✓ Image with Hotspots: A View of Andrew Carnegie

What You Will Learn ...

- Lesson 1: The Beginnings of Industrialization 818**
The Big Idea The Industrial Revolution started in England and soon spread to other countries.
- Lesson 2: Industrialization 826**
The Big Idea The factory system changed the way people lived and worked, introducing a variety of problems.
- Lesson 3: Industrialization Spreads 836**
The Big Idea The industrialization that began in Great Britain spread to other parts of the world.
- Lesson 4: Reforming the Industrial World 844**
The Big Idea The Industrial Revolution led to economic, social, and political reforms.

Timeline of Events 1700–1900

▶ Explore ONLINE!





The Beginnings of Industrialization

The Big Idea

The Industrial Revolution started in England and soon spread to other countries.

Why It Matters Now

The changes that began in Britain paved the way for modern industrial societies.

Key Terms and People

Industrial Revolution
enclosure
crop rotation
industrialization
factors of production
factory
entrepreneur
Henry Bessemer

Setting the Stage

In the United States, France, and Latin America, political revolutions brought in new governments. A different type of revolution now transformed the way people worked. The **Industrial Revolution** refers to the greatly increased output of machine-made goods that began in England in the middle 1700s. This period, which lasted until about the middle 1800s, is sometimes referred to as the First Industrial Revolution. Before the Industrial Revolution, people wove textiles by hand. Then machines began to do this and other jobs. Soon the Industrial Revolution spread from England to continental Europe and North America.

Industrial Revolution Begins in Britain

In 1700, England's physical geography was almost entirely made up of small farms. Wealthy landowners, however, began buying up much of the land that village farmers had once worked. The large landowners dramatically improved farming methods. These innovations amounted to an agricultural revolution.

The Agricultural Revolution After buying up the land of village farmers, wealthy landowners enclosed their land with fences or hedges. The increase in their landholdings enabled them to cultivate larger fields. Within these larger fields, called **enclosures**, landowners experimented with more productive seeding and harvesting methods to boost crop yields. The enclosure movement had two important results. First, landowners tried new agricultural methods. Second, large landowners forced small farmers to become tenant farmers or to give up farming and move to the cities.

Jethro Tull was one of the first of these scientific farmers. He saw that the usual way of sowing seed by scattering it across the ground was wasteful. Many seeds failed to take root. He solved this problem with an invention called the



An English farmer plants his fields in the early 1700s using a seed drill.

seed drill in about 1701. It allowed farmers to sow seeds in well-spaced rows at specific depths. Thus, more seeds took root, boosting crop yields.

Rotating Crops Britain's agricultural revolution caused its physical environment to change. One example of this was deforestation. Most of England's forests had to be cut down for farming. Another example was a change in patterns of landholding, or land use. Scientific farmers had to consider how to best use their land, and the process of **crop rotation** proved to be one of the best developments by the farmers. This landholding pattern improved upon older methods of crop rotation, such as the medieval three-field system. One year, for example, a farmer might plant a field with wheat, which exhausted soil nutrients. The next year, he planted a root crop, such as turnips, to restore nutrients. This might be followed in turn by barley and then clover.

Livestock breeders improved their methods too. In the 1700s, for example, Robert Bakewell increased his mutton (sheep meat) output by allowing only his best sheep to breed. Other farmers followed Bakewell's lead. Between 1700 and 1786, the average weight for lambs climbed from 18 to 50 pounds. As food supplies increased and living conditions improved, England's population mushroomed. An increasing population boosted the demand for food and goods such as cloth. As farmers lost their land to large enclosed farms, many became factory workers.

Why the Industrial Revolution Began in England In addition to a large population of workers, the small island country had extensive natural resources that were a result of its physical geography. Because of these resources, the agricultural revolution gave way to the Industrial Revolution. **Industrialization**, which is the process of developing machine production of goods, required such natural resources as

- water power and coal to fuel the new machines
- iron ore to construct machines, tools, and buildings
- rivers for inland transportation
- harbors from which merchant ships set sail

Reading Check
Analyze Effects
How did population growth spur the Industrial Revolution?

In addition to its natural resources, Britain had an expanding economy to support industrialization. Businesspeople invested in the manufacture of new inventions. Certain private economic institutions, like banks, impacted both individuals and groups. Britain had a particularly highly developed banking system that contributed to the country's industrialization. Individuals and businesses were encouraged by the availability of bank loans to invest in new machinery and expand their operations. Growing overseas trade, economic prosperity, and a climate of progress led to the increased demand for goods.

Britain's political stability gave the country a tremendous advantage over its neighbors. Though Britain took part in many wars during the 1700s, none occurred on British soil. Their military successes gave the British a positive attitude. Parliament also passed laws to help encourage and protect business ventures. Other countries had some of these advantages. But Britain had all the **factors of production**, the resources needed to produce goods and services that the Industrial Revolution required. They included land, labor, and capital (or wealth).

Inventions Spur Industrialization

In an explosion of creativity, inventions now revolutionized industry. Britain's textile industry clothed the world in wool, linen, and cotton. This industry was the first to be transformed. Cloth merchants boosted their profits by speeding up the process by which spinners and weavers made cloth.

Changes in the Textile Industry By 1800, several major inventions had modernized the cotton industry. One invention led to another. In 1733, a machinist named John Kay made a shuttle that sped back and forth on wheels. This flying shuttle, a boat-shaped piece of wood to which yarn was attached, doubled the work a weaver could do in a day. Because spinners could not keep up with these speedy weavers, a cash prize attracted contestants to produce a better spinning machine. Around 1764, a textile worker named James Hargreaves invented a spinning wheel he named after his daughter. His spinning jenny allowed one spinner to work eight threads at a time.

At first, textile workers operated the flying shuttle and the spinning jenny by hand. Then, Richard Arkwright invented the water frame in 1769. This machine used the waterpower from rapid streams to drive spinning wheels. In 1779, Samuel Crompton combined features of the spinning jenny and the water frame to produce the spinning mule. The spinning mule made thread that was stronger, finer, and more consistent than earlier spinning machines. Run by waterpower, Edmund Cartwright's power loom sped up weaving after its invention in 1787. In this way, the energy that water provided helped to cause significant economic change in later 18th-century Britain.

The water frame, the spinning mule, and the power loom were bulky and expensive machines. They took the work of spinning and weaving out of the house. Wealthy textile merchants set up the machines in large

buildings called **factories**. Factories needed waterpower, so the first ones were built near rivers and streams:

“A great number of streams . . . furnish water-power adequate to turn many hundred mills: they afford the element of water, indispensable for scouring, bleaching, printing, dyeing, and other processes of manufacture: and when collected in their larger channels, or employed to feed canals, they supply a superior inland navigation, so important for the transit of raw materials and merchandise.”

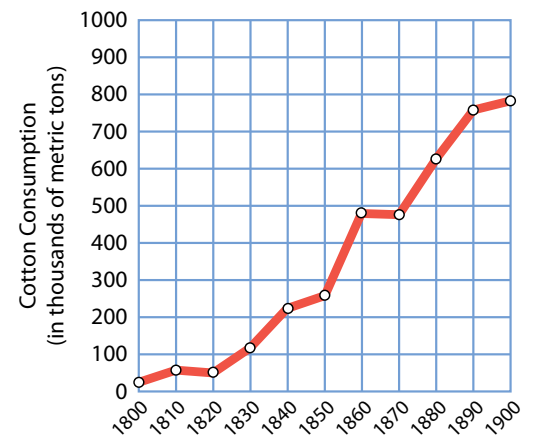
—Edward Bains, *The History of Cotton Manufacture in Great Britain* (1835)

Global Patterns

Textiles Industrialize First

The Industrial Revolution that began in Britain was spurred by a revolution in technology. It started in the textile industry, where inventions in the late 1700s transformed the manufacture of cloth. The demand for clothing in Britain had greatly increased as a result of the population boom caused by the agricultural revolution. These developments, in turn, had an impact worldwide. For example, the consumption of cotton rose dramatically in Britain (see graph). This cotton came from plantations in the American South, where cotton production skyrocketed from 1820 to 1860 in response to demand from English textile mills.

British Cotton Consumption, 1800–1900



Source: *European Historical Statistics, 1750–1975*



Flying shuttle

John Kay's flying shuttle speedily carried threads of yarn back and forth when the weaver pulled a handle on the loom. The flying shuttle greatly increased the productivity of weavers.

Critical Thinking

1. Synthesize How might the technological innovation and industrialization that took place in the textile industry during the Industrial Revolution have provided a model for other industries?

2. Analyze Effects Research the textile industry today to learn how it has been affected by new technology, including computerization. Prepare a two-paragraph summary on the effects of the new technology.

History in Depth

Inventions in America

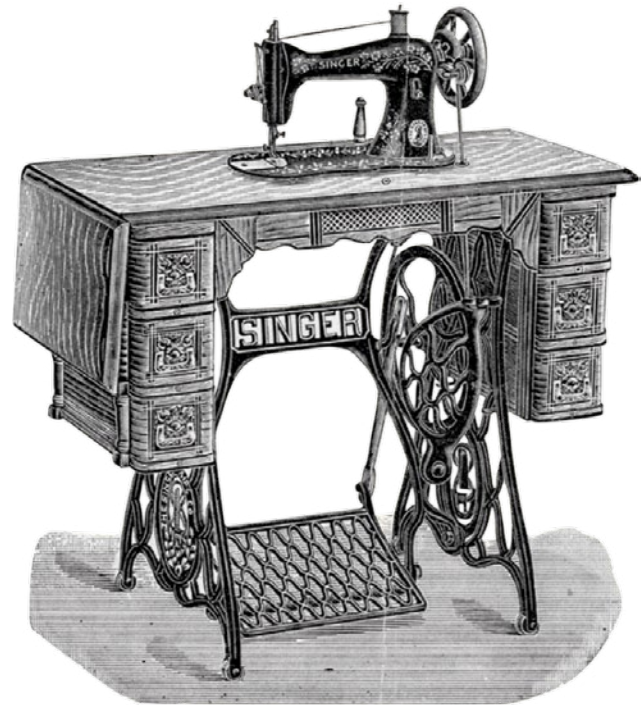
In the United States, American inventors worked at making railroad travel more comfortable, inventing adjustable upholstered seats. They also revolutionized agriculture, manufacturing, and communications:

1831 Cyrus McCormick's reaper boosted American wheat production.

1837 Samuel F. B. Morse, a New England painter, first sent electrical signals over a telegraph.

1851 I. M. Singer improved the sewing machine by inventing a foot treadle (see photograph).

1876 Scottish-born inventor Alexander Graham Bell patented the telephone.



Reading Check

Summarize

What inventions transformed the textile industry?

England's cotton came from plantations in the American South in the 1790s. Removing seeds from the raw cotton by hand was hard work. In 1793, an American inventor named Eli Whitney invented a machine to speed the chore. His cotton gin multiplied the amount of cotton that could be cleaned. American cotton production skyrocketed from 1.5 million pounds in 1790 to 85 million pounds in 1810.

Improvements in Transportation

Progress in the textile industry spurred other industrial improvements. New applications of steam energy would help bring about massive social, economic, and cultural change. The steam engine developed out of the search for a cheap, convenient source of power. As early as 1705, coal miners were using steam-powered pumps to remove water from deep mine shafts. But this early model of a steam engine gobbled great quantities of fuel, making it expensive to run.

Watt's Steam Engine James Watt, a mathematical instrument maker at the University of Glasgow in Scotland, thought about the problem for two years. In 1765, Watt figured out a way to make the steam engine work faster and more efficiently while burning less fuel. In 1774, Watt joined with a businessman named Matthew Boulton. Boulton was an **entrepreneur** (ahn•truh•pruh•NUR), a person who organizes, manages, and takes on the risks of a business. He paid Watt a salary and encouraged him to build better engines.

Reading Check
Find Main Ideas
How did steam-powered boats impact industry in England?

Water Transportation Steam could also propel boats. An American inventor named Robert Fulton ordered a steam engine from Boulton and Watt. He built a steamboat called the *Clermont*, which made its first successful trip in 1807. The *Clermont* later ferried passengers up and down New York’s Hudson River.

In England, water transportation improved with the creation of a network of canals, or human-made waterways. By the mid-1800s, 4,250 miles of inland channels slashed the cost of transporting both raw materials and finished goods.

Road Transportation British roads improved, too, thanks largely to the efforts of John McAdam, a Scottish engineer. Working in the early 1800s, McAdam equipped roadbeds with a layer of large stones for drainage. On top, he placed a carefully smoothed layer of crushed rock. Even in rainy weather, heavy wagons could travel over the new “macadam” roads without sinking in mud.

Private investors formed companies that built roads and then operated them for profit. People called the new roads turnpikes because travelers had to stop at tollgates (turnstiles or turnpikes) to pay tolls before traveling farther.

The Railway Age Begins

Steam-driven machinery powered English factories in the late 1700s. A steam engine on wheels—the railroad locomotive—drove English industry after 1820. It also triggered significant changes in British society and culture.

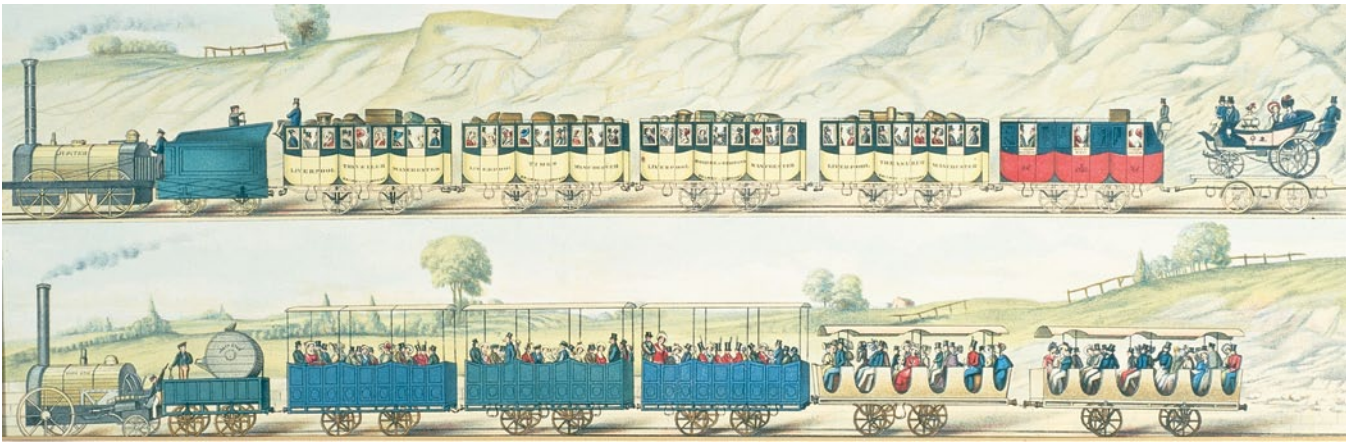
BIOGRAPHY

Henry Bessemer (1813–1898)

Henry Bessemer was a British engineer who invented a cheap way to mass-produce steel. The process he developed became known as the Bessemer Process. The process involved heating iron to a very high temperature and blowing air through it, which purified it and made it strong yet easy to pour. The resulting “mild steel” could be manipulated and worked into parts for building things usually made from heavy iron, such as ships, railroad rails, and train cars.

The Bessemer Process resulted in a massive economic change to Britain’s manufacturing industries. Once steel could be mass-produced, its cost dropped. Soon steel was being used everywhere for building and construction.





First-class passengers on the Liverpool-Manchester Railway in the 1830s rode in covered cars; all others rode in open cars.

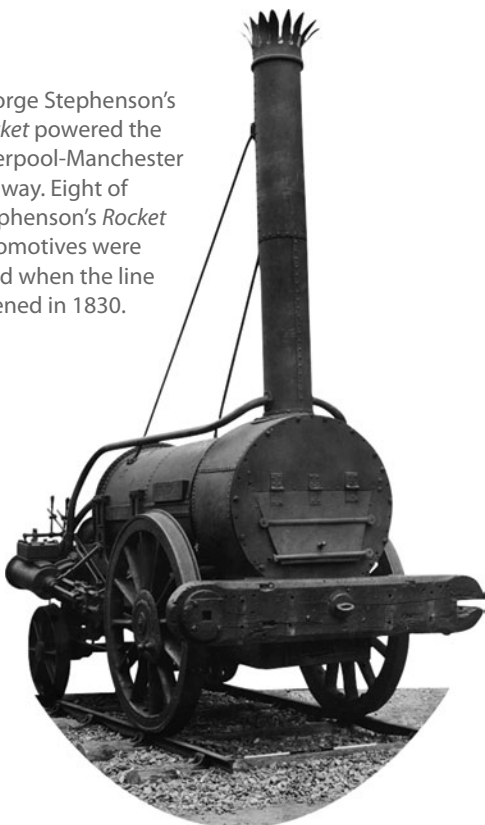
Steam-Driven Locomotives In 1804, an English engineer named Richard Trevithick won a bet of several thousand dollars. He did this by hauling ten tons of iron over nearly ten miles of track in a steam-driven locomotive. Other British engineers soon built improved versions of Trevithick's locomotive. One of these early railroad engineers was George Stephenson. He had gained a solid reputation by building some 20 engines for mine operators in northern England. In 1821, Stephenson began work on the world's first railroad line. It was to run 27 miles from the Yorkshire coal fields to the port of Stockton on the North Sea. In 1825, the railroad opened. It used four locomotives that Stephenson had designed and built.

The Liverpool-Manchester Railway News of this success quickly spread throughout Britain. The entrepreneurs of northern England wanted a railroad line to connect the port of Liverpool with the inland city of Manchester. The track was laid. In 1829, trials were held to choose the best locomotive for use on the new line. Five engines entered the competition. None could compare with the *Rocket*, designed by Stephenson and his son.

Smoke poured from the *Rocket*'s tall smokestack, and its two pistons pumped to and fro as they drove the front wheels. The locomotive hauled a 13-ton load at an unheard-of speed—more than 24 miles per hour. The Liverpool-Manchester Railway opened officially in 1830. It was an immediate success.

Railroads Revolutionize Life in Britain The invention and perfection of the steam-driven locomotive had at least four major economic—and social—effects. First, railroads spurred industrial growth by giving manufacturers a cheap way to transport materials and finished products. Second, the railroad boom created

George Stephenson's *Rocket* powered the Liverpool-Manchester Railway. Eight of Stephenson's *Rocket* locomotives were used when the line opened in 1830.




hundreds of thousands of new jobs for both railroad workers and miners. These miners provided iron for the tracks and coal for the steam engines. Third, the railroads boosted England's agricultural and fishing industries, which could transport their products to distant cities. Finally, by making travel easier, railroads encouraged country people to take distant city jobs.

Steam-powered railroads also signaled a cultural change as millions of British people (particularly members of the growing middle class) began taking train trips for leisure. By 1845, some 30 million passengers were riding Britain's railroads. Railroads lured city dwellers to resorts in the countryside. Rail excursions to the seashore were a common pleasure. Ordinary people had their horizons widened as they visited parts of the country they had never seen before. The British people were also able to see their monarch more often, as Queen Victoria made a point of traveling by train across the country. Like a locomotive racing across the country, the Industrial Revolution brought rapid changes to many aspects of people's lives.

Reading Check

Synthesize How did improvements in transportation promote industrialization in Britain?

Lesson 1 Assessment

- 1. Organize Information** Create a timeline similar to the one shown and fill it in with the names and dates of nine key events or inventions from the period between 1700 and 1830. Which do you think was the most important? Explain.

- 2. Key Terms and People** For each key term or person in the lesson, write a sentence explaining its significance.
- 3. Analyze Effects** How did rising population help the Industrial Revolution develop?
- 4. Make Inferences** What effect did entrepreneurs have upon the Industrial Revolution?
- 5. Develop Historical Perspective** It is the job of historians to develop theses to support or refute positions. Defend or refute this statement: "Without the steam engine, the Industrial Revolution would not have amounted to more than a pile of rickety machines." Support your position with evidence from the lesson as well as some additional research. Be sure to consider alternative explanations of why the steam engine was so significant and question its historical inevitability.

Case Study

Manchester

Industrialization

The Big Idea

The factory system changed the way people lived and worked, introducing a variety of problems.

Why It Matters Now

Many less developed countries are undergoing the difficult process of industrialization today.

Key Terms and People

urbanization
middle class

Setting the Stage

The Industrial Revolution affected every part of life in Great Britain, but proved to be a mixed blessing. Eventually, industrialization led to a better quality of life for most people. But the change to machine production initially caused human suffering. Rapid industrialization brought plentiful jobs, but it also caused unhealthy working conditions, air and water pollution, and the ills of child labor. It also led to rising class tensions, especially between the working class and the middle class.

Industrialization Changes Life

The pace of industrialization accelerated rapidly in Britain. By the 1800s, people could earn higher wages in factories than on farms. With this money, more people could afford to heat their homes with coal from Wales and dine on Scottish beef. They wore better clothing, too, woven on power looms in England's industrial cities. Cities swelled with waves of job seekers.



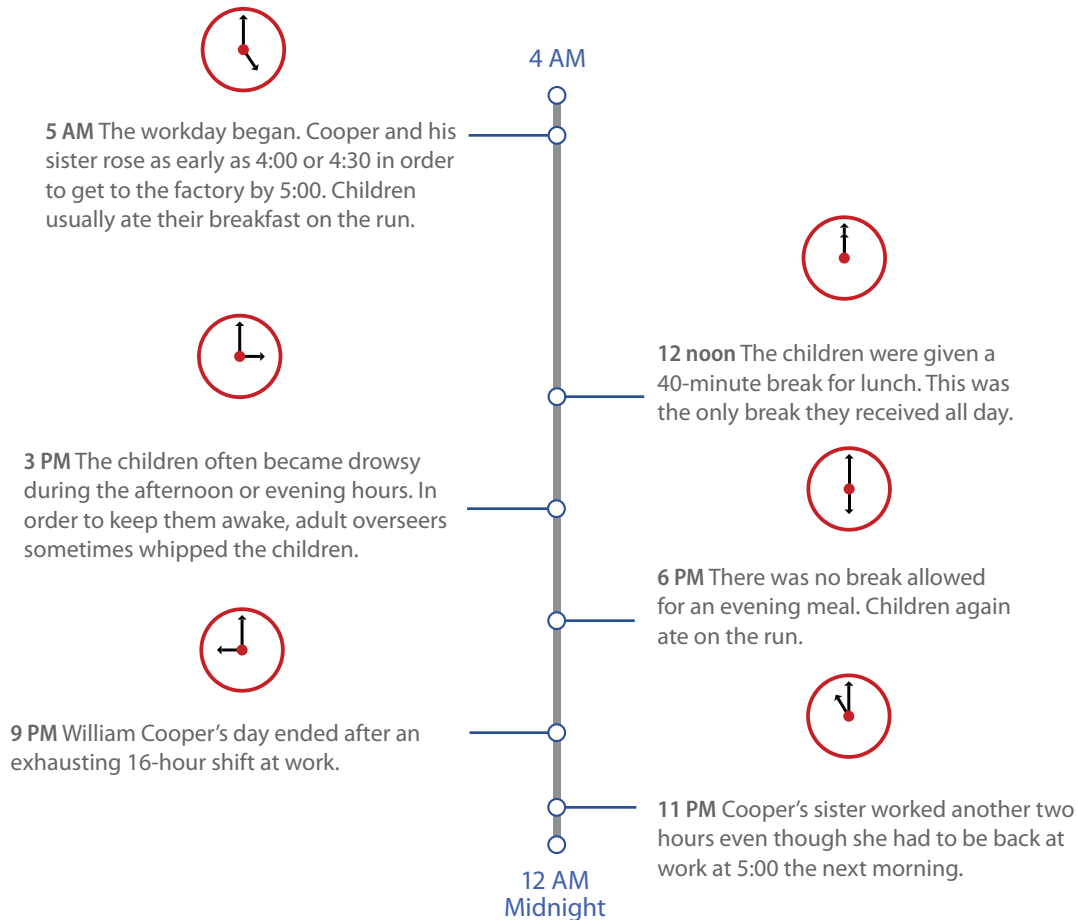
As cities grew, men, women, and children crowded into tenements and row houses such as these in London.

Industrial Cities Rise For centuries, most Europeans had lived in rural areas. After 1800, the balance shifted toward cities. This shift was caused by the growth of the factory system, where the manufacturing of goods was concentrated in a central location. Between 1800 and 1850, the number of European cities boasting more than 100,000 inhabitants rose from 22 to 47. Most of Europe's urban areas at least doubled in population; some even quadrupled. This period was one of **urbanization**—city building and the migration of people to cities.

History in Depth

The Day of a Child Laborer, William Cooper

Child labor was common in many industries during the Industrial Revolution. William Cooper began working in a textile factory at the age of ten. He had a sister who worked upstairs in the same factory. In 1832, Cooper was called to testify before a parliamentary committee about the conditions among child laborers in the textile industry. The following sketch of his day is based upon his testimony.



Britain's natural resources and physical geography influenced industrialization and urbanization. For example, factories developed in clusters because entrepreneurs built them near sources of energy, such as water and coal. New uses for these forms of energy brought about massive economic change, as major new industrial centers sprang up between the coal-rich area of southern Wales and the Clyde River valley in Scotland. But the biggest of these centers developed in England.

Britain's capital, London, was the country's most important city. It had a population of about 1 million people by 1800. During the 1800s, its population exploded, providing a vast labor pool and market for new industry. London became Europe's largest city, with twice as many people

as its closest rival (Paris). Newer cities challenged London's industrial leadership. Birmingham and Sheffield became iron-smelting centers. Leeds and Manchester dominated textile manufacturing. Along with the port of Liverpool, Manchester formed the center of Britain's bustling cotton industry. During the 1800s, Manchester experienced rapid growth from around 45,000 in 1760 to 300,000 by 1850.

Living Conditions Because England's cities grew rapidly, a variety of social, economic, and political problems arose. Often these problems affected many aspects of society all at once. For example, cities often had no development plans, sanitary codes, or building codes. Moreover, they lacked adequate housing, education, and police protection for the people who poured in from the countryside to seek jobs. Most of the unpaved streets had no drains, and garbage collected in heaps on them. Workers lived in dark, dirty shelters, with whole families—men, women, and children—crowding into one bedroom.

Public health became a major social, economic, and political concern as sickness was widespread. Epidemics of the deadly disease cholera regularly swept through the slums of Great Britain's industrial cities. In 1842, a British government study showed an average life span to be 17 years for working-class people in one large city, compared with 38 years in a nearby rural area. This level of poverty was clearly a social and economic issue. It was also a political problem because people expected solutions from their local authorities and agencies. But not everyone in urban areas lived miserably. Well-to-do merchants and factory owners often built luxurious homes in the suburbs.



Sheffield became a center of steel manufacturing. In fact, the Bessemer Process was used for the first time in a factory in Sheffield. The negative impact of being such a vital industrial center was terrible pollution.

Elizabeth Gaskell

Elizabeth Gaskell's *Mary Barton* (1848) is a work of fiction. But it presents a startlingly accurate portrayal of urban life experienced by many at the time. Gaskell provides a realistic description of the dank cellar dwelling of one family in a Manchester slum:

“You went down one step even from the foul area into the cellar in which a family of human beings lived. It was very dark inside. The window-panes many of them were broken and stuffed with rags. . . . the smell was so fetid [foul] as almost to knock the two men down. . . . they began to penetrate the thick darkness of the place, and to see three or four little children rolling on the damp, nay wet brick floor, through which the stagnant, filthy moisture of the street oozed up.”

—Elizabeth Gaskell, *Mary Barton*



Elizabeth Gaskell (1810–1865) was a British writer who wrote about how ordinary people were impacted by poverty.

Analyze Historical Sources

How does Gaskell indicate her sympathy for the working class in this passage?

Working Conditions Poor living conditions were not the only social, economic, and political problems that resulted from the rise of cities during the Industrial Revolution. The conditions under which people worked presented new challenges as well.

To increase production, factory owners wanted to keep their machines running as many hours as possible. As a result, the average worker spent 14 hours a day at the job, 6 days a week. Work did not change with the seasons, as it did on the farm. Instead, work remained the same week after week, year after year.

Industry also posed new dangers for workers. Factories were seldom well lit or clean. Machines injured workers. A boiler might explode or a drive belt might catch an arm. This safety issue was also a political one, for there was no government program to provide aid in case of injury. The most dangerous conditions of all were found in coal mines. Frequent accidents, damp conditions, and the constant breathing of coal dust made the average miner's life span ten years shorter than that of other workers. Many women and children were employed in the mining industry because they were the cheapest source of labor.

Reading Check

Find Main Ideas

What is the main idea of the section titled “Working Conditions”?

Class Tensions Grow

Though poverty gripped Britain's working classes, the Industrial Revolution created enormous amounts of wealth in the nation. Most of this new money belonged to factory owners, shippers, and merchants. These people were part of a growing **middle class**, a social class made up of skilled workers, professionals, businesspeople, and wealthy farmers.

The Middle Class The new middle class transformed the social structure of Great Britain. In the past, landowners and aristocrats had occupied the top position in British society. With most of the wealth, they wielded the social and political power. Now some factory owners, merchants, and bankers grew wealthier than the landowners and aristocrats. Yet important social distinctions divided the two wealthy classes. Landowners looked down on those who had made their fortunes in the “vulgar” business world. Not until late in the 1800s were rich entrepreneurs considered the social equals of the lords of the countryside.

Gradually, a larger middle class—neither rich nor poor—emerged. The upper middle class consisted of government employees, doctors, lawyers, and managers of factories, mines, and shops. The lower middle class included factory overseers and such skilled workers as toolmakers, mechanical drafters, and printers. These people enjoyed a comfortable standard of living.

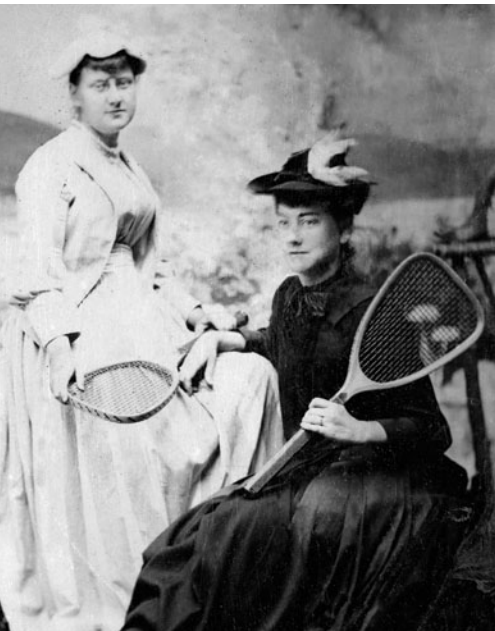
The Working Class During the years 1800 to 1850, however, laborers, or the working class, saw little improvement in their living and working conditions. They watched their livelihoods disappear as machines replaced them. Some working-class people became so frustrated that they smashed the machines they thought were putting them out of work.

One group of such workers was called the Luddites. They were named after Ned Ludd. Ludd, probably a mythical English laborer, was said to have destroyed weaving machinery around 1779. The Luddites attacked whole factories in northern England beginning in 1811, destroying laborsaving machinery. Outside the factories, mobs of workers rioted, mainly because of poor living and working conditions.

Daily Life New economic ideas were not the only effects of the Industrial Revolution and urbanization. Massive social changes occurred for men, women, and children, and each group found new roles.

The vast majority of industrial workers were men, as millions of farmers became factory workers. They developed a new work ethic that crossed over into daily life. Men were expected to be the breadwinners and the heads of their families. At the end of the workday, men found ways to socialize with one another. For example, they joined men's clubs, which were social organizations whose membership was limited to men only.

Industrialization and urbanization affected the lives of women in particular ways. Middle-class women were freed from chores because many could afford to hire domestic help. Some even began to attend college and



This image is of two British women (most likely from the middle or upper class) preparing for a game of tennis.

Reading Check

Summarize

Describe the social classes in Britain.

get jobs as teachers and nurses. Those who did work were often criticized by people who said that they should not work outside the home. Women who went to work in factories were separated from their families and earned low wages in low-skill jobs. Other working-class women found jobs as cooks, maids, and childcare workers because more families could afford to hire them. Others found some new educational and cultural opportunities in cities.

Both middle-class and working-class families became more tightly organized. Most men worked outside their homes and became the heads of their families, while women did domestic chores and raised the children. Middle-class children engaged in new leisure activities, like learning to play a musical instrument. Families joined together in various pastimes, such as reading. Wealthier families found time to attend public events, like circuses or symphony concerts.

Positive Effects of the Industrial Revolution

Despite the problems that followed industrialization, the Industrial Revolution had a number of positive effects. It created jobs for workers. It contributed to the wealth of the nation. It fostered technological progress and invention. It greatly increased the production of goods and raised the standard of living. Perhaps most important, it provided the hope of improvement in people's lives.

The Industrial Revolution produced a number of other benefits as well. These included healthier diets, better housing, and cheaper, mass-produced clothing. Because the Industrial Revolution created a demand for engineers as well as clerical and professional workers, it expanded educational opportunities.

The middle and upper classes prospered immediately from the Industrial Revolution. For the workers it took longer, but their lives gradually improved during the 1800s. Laborers eventually won higher wages, shorter hours, and better working conditions after they joined together to form labor unions.

Long-Term Effects The long-term effects of the Industrial Revolution are still evident. Most people today in industrialized countries can afford consumer goods that would have been considered luxuries 50 or 60 years ago. In addition, their living and working conditions are much improved over those of workers in the 19th century. Also, profits derived from industrialization produced tax revenues. These funds have allowed local, state, and federal governments to solve political problems by investing in urban improvements and raising the standard of living of most city dwellers.

The economic successes of the Industrial Revolution, and also the problems created by it, were clearly evident in one of Britain's new industrial cities in the 1800s—Manchester.

Reading Check

Find Main Ideas

In what way did the Industrial Revolution provide hope for people?

The Mills of Manchester

Manchester's unique advantages made it a leading example of the new industrial city. This northern English town had ready access to water-power. It also had available labor from the nearby countryside and an outlet to the sea at Liverpool.

"From this filthy sewer pure gold flows," wrote Alexis de Tocqueville (ah•lehk•SEE-duh-TOHK•vihl), the French writer, after he visited Manchester in 1835. Indeed, the industrial giant showed the best and worst of the Industrial Revolution. Manchester's rapid, unplanned growth made it an unhealthy place for the poor people who lived and worked there. But wealth flowed from its factories. It went first to the mill owners and the new middle class. Eventually, although not immediately, the working class saw their standard of living rise as well.

Manchester's business owners took pride in mastering each detail of the manufacturing process. They worked many hours and risked their own money. For their efforts, they were rewarded with high profits. Many erected gracious homes on the outskirts of town.

To provide the mill owners with high profits, workers labored under terrible conditions. Children as young as six joined their parents in the factories. There, for six days a week, they toiled from 6 a.m. to 7 or 8 p.m., with only half an hour for lunch and an hour for dinner. To keep the children awake, mill supervisors beat them. Tiny hands repaired broken threads in Manchester's spinning machines, replaced thread in the bobbins, or swept up cotton fluff. The dangerous machinery injured many children. The fluff filled their lungs and made them cough.

Until the first Factory Act passed in 1819, the British government exerted little control over child labor in Manchester and other factory cities. The act restricted working age and hours. For years after the act passed, young children still did heavy, dangerous work in Manchester's factories.

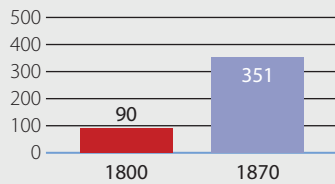
This engraving shows urban growth and industrial pollution in Manchester.



GROWTH OF CITIES

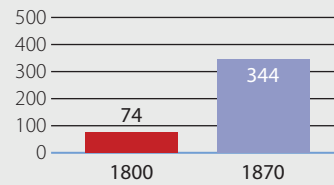
MANCHESTER

Population (in thousands)



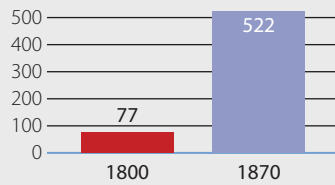
BIRMINGHAM

Population (in thousands)



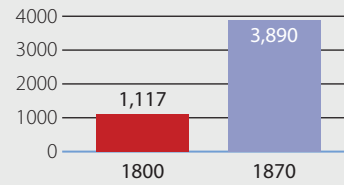
GLASGOW

Population (in thousands)



LONDON

Population (in thousands)



Interpret Graphs

How do the bar graphs help illustrate the effects of industrialization?

Putting so much industry into one place also changed the natural environment by polluting it. The coal that powered factories and warmed houses blackened the air. The iron smelting factories in one region of northwestern England emitted so much pollution that the region was nicknamed “black country.” Because the iron-smelting required fires, one American visitor to the region called it “black by day and red by night.” Textile dyes and other wastes poisoned Manchester’s Irwell River. An eyewitness observer wrote the following description of the river in 1862:

“Steam boilers discharge into it their seething contents, and drains and sewers their fetid impurities; till at length it rolls on—here between tall dingy walls, there under precipices of red sandstone—considerably less a river than a flood of liquid manure.”

— Hugh Miller, *The Old Red Sandstone*

Like other new industrial cities of the 19th century, Manchester produced consumer goods and created wealth on a grand scale. Yet it also stood as a reminder of the ills of rapid and unplanned industrialization. In the 1800s, the industrialization that began in Great Britain spread to the United States and to continental Europe.

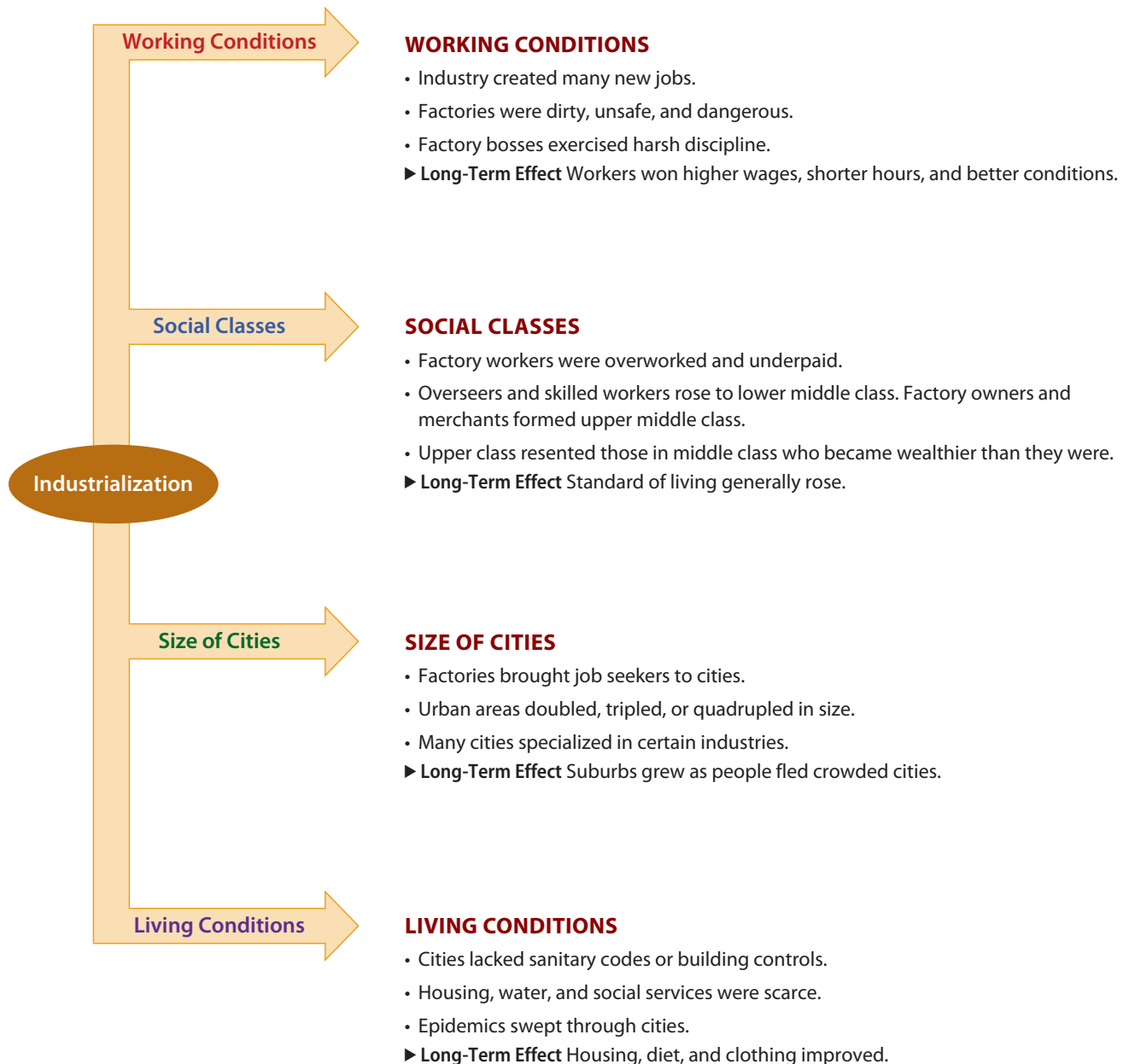
Reading Check

Draw Conclusions
Whose interests did child labor serve?

Industrialization

Industrialization is the process of developing industries that use machines to produce goods. This process not only revolutionizes a country's economy, it also transforms social conditions and class structures. It also creates social, economic, and political problems as cities grow at a rapid rate.

EFFECTS OF INDUSTRIALIZATION



Analyze Effects

What were some advantages and disadvantages of industrialization?

Now and Then

Child Labor Today

To save on labor costs, many corporations have moved their operations to developing countries, where young children work long hours under wretched conditions. In 2015, their number was estimated at 215 million children aged 5–17. They are unprotected by labor laws. For mere pennies per hour, children weave carpets, sort vegetables, or assemble expensive athletic shoes.

Several organizations are working to end child labor, including the Child Welfare League of America and the International Labor Rights Fund.



Lesson 2 Assessment

- 1. Organize Information** Create an outline similar to the one shown and fill it in with facts and details from the chapter about industrialization and its effects. Add a third and fourth topic to the two that are given. Which change brought about by industrialization had the greatest impact?

- I. Industrialization Changes Life
 - A.
 - B.
 - II. Class Tensions Grow
- 2. Key Terms and People** For each key term or person in the lesson, write a sentence explaining its significance.
- 3. Analyze Causes** Why did people flock to British cities and towns during the Industrial Revolution?
- 4. Summarize** How did industrialization contribute to city growth?
- 5. Evaluate** How were class tensions affected by the Industrial Revolution?
- 6. Form Opinions** The Industrial Revolution has been described as a mixed blessing. Do you agree or disagree? Support your answer with text references.



Industrialization Spreads

The Big Idea

The industrialization that began in Great Britain spread to other parts of the world.

Why It Matters Now

The Industrial Revolution set the stage for the growth of modern cities and a global economy.

Key Terms and People

mass production
interchangeable parts
assembly line
division of labor
specialization
economic interdependence
stock
corporation

Setting the Stage

Great Britain's favorable geography and its financial systems, political stability, and natural resources sparked industrialization. British merchants built the world's first factories. When these factories prospered, more labor-saving machines and factories were built. Eventually, the Industrial Revolution that had begun in Britain spread both to the United States and to continental Europe. Countries that had conditions similar to those in Britain were ripe for industrialization.

Industrial Development in the United States

The United States possessed the same natural resources that allowed Britain to mechanize its industries. America's physical geography had fast-flowing rivers and rich deposits of coal and iron ore. Its resources included a supply of laborers made up of farm workers and immigrants. During the War of 1812, Britain blockaded the United States, trying to keep it from engaging in international trade. This blockade forced the young country to use its own natural resources to develop independent industries. Those industries would manufacture the goods the United States could no longer import.

Industrialization in the United States As in Britain, industrialization in the United States began in the textile industry. Eager to keep the secrets of industrialization to itself, Britain had forbidden engineers, mechanics, and toolmakers to leave the country. In 1789, however, a young British mill worker named Samuel Slater emigrated to the United States. There, Slater built a spinning machine from memory and a partial design. In 1793, he built what is known today as Slater's Mill in Pawtucket, Rhode Island. For his contribution, Slater became known as the Father of American Industry.

The following year, Moses Brown opened the first factory in the United States to house Slater's machines in Pawtucket, Rhode Island. But the Pawtucket factory mass-produced only one part of finished cloth, the thread.

In 1813, Francis Cabot Lowell of Boston and four other investors revolutionized the American textile industry. They mechanized every stage in the manufacture of cloth. Their weaving factory in Waltham, Massachusetts, earned them enough money to fund a larger operation in another Massachusetts town. Lowell took advantage of the area's physical geography and natural resources by using the power of a nearby waterfall to run his machinery. He also built his mills on a network of six miles of canals. When Lowell died, the remaining partners named the town after him. By the late 1820s, Lowell, Massachusetts, had become a booming manufacturing center and a model for other such industrial towns.

These factory towns needed people to work there, and Samuel Slater had a strategy of hiring entire families—not just able-bodied men. He also divided the factory work into simple tasks. Slater's approach, called the Rhode Island system, was emulated by mill owners throughout the Northeast. Owners advertised for "Men with growing families wanted." These advertisements impacted many families as well as individuals looking for opportunities to earn money and to learn a new skill.

Thousands of young single women flocked from their rural homes to work as mill girls in factory towns. There, they could make higher wages and have some independence. However, to ensure proper behavior, they were watched closely inside and outside the factory by their employers. The mill girls toiled more than 12 hours a day, 6 days a week, for decent wages. For some, the mill job was an alternative to being a servant and was often the only other job open to them:

"Country girls were naturally independent, and the feeling that at this new work the few hours they had of everyday leisure were entirely their own was a satisfaction to them. They preferred it to going out as 'hired help.' It was like a young man's pleasure in entering upon business for himself. Girls had never tried that experiment before, and they liked it."

—Lucy Larcom, *A New England Girlhood*



Teenage mill girls at a Georgia cotton mill

Textiles led the way, but clothing manufacture and shoemaking also underwent mechanization. Especially in the Northeast, skilled workers and farmers had formerly worked at home. Now they labored in factories in towns and cities such as Waltham, Lowell, and Lawrence, Massachusetts.

The Process of Mass Production The factory system transformed the workplace for many people. New processes changed how people worked and what they could produce.

Many changes in industry developed in the United States. One of these changes was the introduction of **mass production**—the system of manufacturing large numbers of identical items. Elements of mass production, including interchangeable parts and the assembly line, came to be known as the American system.

Interchangeable parts are identical machine-made parts. They made production and repair of factory-made goods more efficient. Before industrialization, one skilled worker might have made an entire gun, clock, or other product by himself. He or she would make or gather all the parts and assemble them. The process could be slow, and because the parts were all handmade, the finished products were often a little different from one another. With interchangeable parts, however, one worker could put together many identical products in a short time. Making repairs was easier, too, because replacement parts did not have to be custom-made to fit.

Another element of mass production related to movement within factories. In early workshops, the product stayed in one place and workers moved around it, adding parts and making refinements. The **assembly line** was an innovation that changed the way people worked in factories. In an assembly line, the product moves from worker to worker, as each person performs a step in the manufacturing process. Having different workers do different tasks is called **division of labor**. Division of labor allows workers to make many items quickly. Division of labor is a form of **specialization**. Specialization is an economic concept that refers to separating tasks. When people in a factory or company specialize, they work at one kind of job and learn to do it well.

Mass production had a great impact on industry. One big advantage was a dramatic increase in production. Businesses that made many items quickly could charge less per item. As a result, more people could afford to buy these mass-produced goods. For employees, however, mass production could lead to more repetitious jobs. At first, some workers protested, refusing to work quickly. But the changes could not be stopped, and mass production became the standard system in factories.

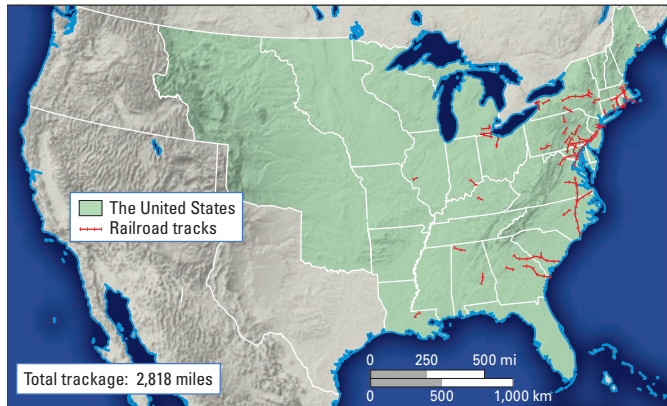
Another result of more efficient labor practices was an increase in **economic interdependence**. A society that is economically interdependent is one in which people rely on one another for the resources, goods, and services they need. Economic interdependence demonstrated that people did not have to make everything they needed or wanted themselves.

Economic interdependence was impacted by advances in technology, communication, and transportation. New technology helped produce goods, such as light bulbs and sewing machines, that brought more convenience to people's lives. New forms of communication and transportation helped connect places where different resources, goods, and services were available. In addition, advances in transportation allowed people and products to travel quickly from place to place.

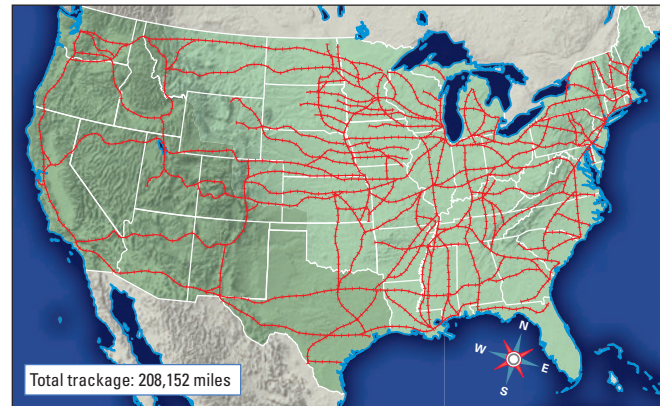
Later Expansion of U.S. Industry The Northeast experienced much industrial growth in the early 1800s. Nonetheless, the United States remained primarily agricultural until the Civil War ended in 1865. During

The Growth of Railroads in the United States

Railroad System, 1840



Railroad System, 1890



Interpret Maps

- 1. Region** In what part of the country were the first railroads built? By 1890, what other part of the country was densely covered by railroad tracks?
- 2. Movement** In what direction did the railroads help people move across the country?

the last third of the 1800s, the country experienced a technological boom. This period is sometimes referred to as the Second Industrial Revolution. As in Britain, a number of causes contributed to this boom. These included a wealth of natural resources, among them oil, coal, and iron; a burst of inventions, such as the electric light bulb and the telephone; and a swelling urban population that consumed the new manufactured goods.

An important factor that caused industrial cities to grow was immigration. The Industrial Revolution would have happened at a considerably slower rate had immigrants to the United States not provided much-needed labor. The 1880s saw the beginning of a wave of millions of immigrants coming from Europe. These new Americans were drawn by jobs in America's many factories. They had a powerful impact on American life. These immigrants, both skilled and unskilled, contributed to the nation's economic success and its cultural diversity.

Just as they did in Britain, railroads played a major role in America's industrialization. Cities like Chicago and Minneapolis expanded rapidly during the late 1800s. This was due to their location along the nation's expanding railroad lines. Chicago's stockyards and Minneapolis's grain industries prospered by selling products to the rest of the country. Indeed, the railroads themselves proved to be a profitable business. By the end of the 1800s, a limited number of large, powerful companies controlled more than two-thirds of the nation's railroads. Businesses of all kinds began to merge as the railroads had. Smaller companies joined together to form larger ones.

The Rise of Corporations Building large businesses like railroads required a great deal of money. To raise the money, entrepreneurs sold shares of **stock**, or certain rights of ownership. Thus people who bought stock became part owners of these businesses, which were

called corporations. A **corporation** is a business owned by stockholders who share in its profits but are not personally responsible for its debts. Corporations are generally considered to be private economic institutions, since they are not part of the government. They are able to generate, distribute, and purchase goods and services. During the Industrial Revolution, corporations were able to raise the large amounts of capital needed to invest in industrial equipment.

In the late 1800s, large corporations such as Standard Oil (founded by John D. Rockefeller) and the Carnegie Steel Company (founded by Andrew Carnegie) sprang up. These institutions impacted a great number of individuals and groups as they sought to control every aspect of their own industries in order to make big profits. Big business—the giant corporations that controlled entire industries—also made big profits by reducing the cost of producing goods. In the United States as elsewhere, workers earned low wages for laboring long hours, while stockholders earned high profits and corporate leaders made fortunes.

Reading Check

Analyze Effects

How was economic interdependence impacted by advances in transportation?

Continental Europe Industrializes

European businesses yearned to adopt the “British miracle,” the result of Britain’s profitable new methods of manufacturing goods. But the troubles sparked by the French Revolution and the Napoleonic wars between 1789 and 1815 had halted trade, interrupted communication, and caused inflation in some parts of the continent. European countries watched the gap widen between themselves and Britain. Even so, industrialization eventually reached continental Europe.

Beginnings in Belgium Belgium led Europe in adopting Britain’s new technology. It had rich deposits of iron ore and coal as well as fine waterways for transportation. As in the United States, British skilled workers played a key role in industrializing Belgium.

Industrialization spread to Denmark in the mid-1800s. People began to move to cities in large numbers. In 1847, the country built its first rail line. This 1885 painting by Peter Severin Kroyer shows Danish workers laboring in a steel mill.



Industrialization in Japan

With the beginning of the Meiji era in Japan in 1867, the central government began an ambitious program to transform the country into an industrialized state. It financed textile mills, coal mines, shipyards, and cement and other factories. It also asked private companies to invest in industry.

Some companies had been in business since the 1600s. But new companies sprang up too. Among them was the Mitsubishi company, founded in 1870 and still in business.

The industrializing of Japan produced sustained economic growth for the country. But it also led

to strengthening the military and to Japanese imperialism in Asia.

In the years following World War II, Japan experienced an astonishing economic

boom—largely driven by its industrial sector. Today, Japan remains an industrial powerhouse. It manufactures automobiles, steel, and personal electronics, like smartphones. Japan is the world's third-largest economy, behind the United States and China.



Samuel Slater had smuggled the design of a spinning machine to the United States. Much like him, a Lancashire carpenter named William Cockerill illegally made his way to Belgium in 1799. He carried secret plans for building spinning machinery. His son John eventually built an enormous industrial enterprise in eastern Belgium. It produced a variety of mechanical equipment, including steam engines and railway locomotives. Carrying the latest British advances, more British workers came to work with Cockerill. Several then founded their own companies in Europe.

Germany Industrializes Germany was politically divided in the early 1800s. Economic isolation and scattered resources hampered countrywide industrialization. Instead, pockets of industrialization appeared, as in the coal-rich Ruhr Valley of west central Germany. Beginning around 1835, Germany began to copy the British model. Germany imported British equipment and engineers. German manufacturers also sent their children to England to learn industrial management.

Most important, Germany built railroads that linked its growing manufacturing cities, such as Frankfurt, with the Ruhr Valley's coal and iron ore deposits. In 1858, a German economist wrote, "Railroads and machine shops, coal mines and iron foundries, spinneries and rolling mills seem to spring up out of the ground, and smokestacks sprout from the earth like mushrooms." Germany's economic strength spurred its ability to develop as both an industrial and military power by the late 1800s.

Expansion Elsewhere in Europe In the rest of Europe, as in Germany, industrialization during the early 1800s proceeded by region rather than by country. Even in countries where agriculture dominated, pockets of industrialization arose. For example, Bohemia developed a spinning industry. Spain's Catalonia processed more cotton than Belgium. Northern Italy mechanized its textile production, specializing in silk spinning. Serf labor ran factories in regions around Moscow and St. Petersburg.

In France, sustained industrial growth occurred after 1830. French industrialization was more measured and controlled than in other countries because the agricultural economy remained strong. As a result, France avoided the great social and economic problems caused by industrialization. A thriving national market for new French products was created after 1850, when the government began railroad construction.

In Russia, nationalism played a key role in that country's move toward industrialization. At that time, Russia did not have the modern technology and industry necessary to build a military that could compete with Europe's powers. After the assassination of Czar Alexander II in 1881, his successor, Alexander III, promoted industrial expansion as a way for Russia to gain greater power in Europe.

For a variety of reasons, many European countries did not industrialize. In some nations, the social structure delayed the adoption of new methods of production. The accidents of geography held back others. In Austria-Hungary and Spain, transportation posed great obstacles. Austria-Hungary's mountains defeated railroad builders. Spain lacked both good roads and waterways for canals.

Reading Check

Analyze Causes
What factors slowed industrialization in Germany?

The Impact of Industrialization

The development of industrialization in places like Britain and the United States impacted the expanding market economy around the world. Put more succinctly, the Industrial Revolution shifted the world balance of power. It increased economic competition between industrialized nations and poverty in less-developed nations.

Rise of Global Inequality Industrialization widened the wealth gap between industrialized and nonindustrialized countries, even while it strengthened their economic ties via world markets. To keep factories running and workers fed, industrialized countries required a steady supply of raw materials from less-developed lands. In turn, industrialized countries viewed poor countries as markets for their manufactured products.

Britain led in exploiting its overseas colonies for resources and markets. Soon other European countries, the United States, Russia, and Japan followed Britain's lead, seizing colonies for their economic resources. Imperialism, the policy of extending one country's rule over many other lands, gave even more power and wealth to these already wealthy nations. Imperialism was born out of the cycle of industrialization, the need for resources to supply the factories of Europe, and the development of new markets around the world.

Transformation of Society Between 1700 and 1900, revolutions in agriculture, production, transportation, and communication changed the lives of people in Western Europe and the United States. Industrialization gave Europe tremendous economic power. In contrast, the

The Crystal Palace Exposition in London in 1851 celebrated the "works of industry of all nations."



Historical Source

How Technology Aided Imperialism

In this excerpt from his 1999 book *Guns, Germs, and Steel*, Jared Diamond related an incident to show how technological innovation helped Europeans conquer other lands.

As you read this secondary source, try to distinguish facts from the author's opinions. Also keep in mind that an author may have philosophical assumptions, beliefs, or biases about the subject—either implicit or explicit.

Analyze Historical Sources

1. Do you think the second sentence of the excerpt is a fact or an opinion? Explain. Would Jared Diamond be a credible authority on the relationship between technology and imperialism? Why or why not? Do you detect any philosophical assumptions, beliefs, or biases about the subject from Jared Diamond? Were they implicit or explicit? Explain your answer.

“In 1808 a British sailor named Charlie Savage equipped with muskets and excellent aim arrived in the Fiji Islands. [He] proceeded single-handedly to upset Fiji’s balance of power. Among his many exploits, he paddled his canoe up a river to the Fijian village of Kasavu, halted less than a pistol shot’s length from the village fence, and fired away at the undefended inhabitants. His victims were so numerous that . . . the stream beside the village was red with blood. Such examples of the power of guns against native peoples lacking guns could be multiplied indefinitely.”

Reading Check

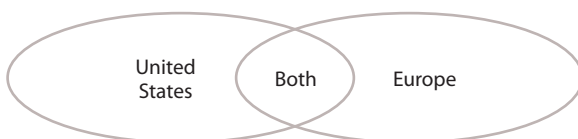
Summarize

Why did imperialism grow out of industrialization?

economies of Asia and Africa were still based on agriculture and small workshops. Industrialization revolutionized every aspect of society, from daily life to life expectancy. Despite the hardships early urban workers suffered, population, health, and wealth eventually rose dramatically in all industrialized countries. The development of a middle class created great opportunities for education and democratic participation. Greater democratic participation, in turn, fueled a powerful movement for social reform.

Lesson 3 Assessment

1. **Organize Information** Create a Venn diagram similar to the one shown, but instead of filling it with the given labels, fill it with details about how industrialization spread to the United States and continental Europe. Then, in the center, note details that they had in common. Which aspect of industrialization had the most impact in the United States? in continental Europe?



2. **Key Terms and People** For each key term or person in the lesson, write a sentence explaining its significance.
3. **Synthesize** What early industries mechanized in the United States?
4. **Analyze Effects** How did the Industrial Revolution shift the world balance of power?
5. **Make Inferences** Why was Britain unable to keep industrial secrets away from other nations?
6. **Form Opinions** What was the most significant effect of the Industrial Revolution?



Reforming the Industrial World

The Big Idea

The Industrial Revolution led to economic, social, and political reforms.

Why It Matters Now

Many modern social welfare programs developed during this period of reform.

Key Terms and People

laissez faire
 Adam Smith
 capitalism
 utilitarianism
 socialism
 Karl Marx
 communism
 anarchism
 union
 strike

Setting the Stage

In industrialized countries in the 19th century, the Industrial Revolution opened a wide gap between the rich and the poor. Business leaders believed that governments should stay out of economic affairs. Reformers, however, felt that governments needed to play an active role to improve conditions for the poor. Workers also demanded more rights and protection. They formed labor unions to increase their influence.

The Philosophers of Industrialization

The term **laissez faire** (leh-s•ay-FAIR) refers to the economic policy of letting owners of industry and business set working conditions without interference. This policy favors a free market unregulated by the government. The term is French for “let do,” and by extension “let people do as they please.”

Laissez-faire Economics French economic philosophers of the Enlightenment criticized the idea that nations grow wealthy by placing heavy tariffs on foreign goods. In fact, they argued, government regulations interfered with the production of wealth. These philosophers believed that if government allowed free trade—the flow of commerce without government regulation—the economy would prosper.

Adam Smith, a professor at the University of Glasgow, Scotland, defended the idea of a free economy, or free markets, in his 1776 book *The Wealth of Nations*. According to Smith, economic liberty guaranteed economic progress. As a result, government should not interfere. Smith’s arguments rested on what he called the three natural laws of economics:

- law of self-interest—People work for their own good.
- law of competition—Competition forces people to make a better product.
- law of supply and demand—Enough goods would be produced at the lowest possible price to meet demand in a market economy.

Supply and Demand The laws of supply and demand impacted many individuals and groups during the Industrial Revolution. For example, during Britain's agricultural revolution, increased food supplies resulted in larger populations, and these people demanded more food and goods like cloth. This demand caused farmers and textile manufacturers to increase production so as to increase their supply. Another example of the impact of supply and demand occurred in America during its own Industrial Revolution. As the years progressed and manufacturing increased, there was a high demand for cheap labor. That caused groups of people to leave Europe and immigrate to America, looking for work.

The Economists of Capitalism Smith's basic ideas were supported by British economists Thomas Malthus and David Ricardo. Like Smith, they believed that natural laws governed economic life. Their important ideas were the foundation of laissez-faire capitalism. **Capitalism** is an economic system in which the factors of production are privately owned and money is invested in business ventures to make a profit. These ideas also helped bring about the Industrial Revolution.

In *An Essay on the Principle of Population*, written in 1798, Thomas Malthus argued that population tended to increase more rapidly than the food supply. Without wars and epidemics to kill off the extra people, most were destined to be poor and miserable. The predictions of Malthus seemed to be coming true in the 1840s.

David Ricardo, a wealthy stockbroker, took Malthus's theory one step further in his book, *Principles of Political Economy and Taxation* (1817). Like Malthus, Ricardo believed that a permanent underclass would always be poor. In a market system, if there are many workers and abundant resources, then labor and resources are cheap. If there are few workers and scarce resources, then they are expensive. Ricardo believed that wages would be forced down as population increased.

Laissez-faire thinkers such as Smith, Malthus, and Ricardo opposed government efforts to help poor workers. They thought that creating minimum wage laws and better working conditions would upset the free market system, lower profits, and undermine the production of wealth in society.

Reading Check

Summarize

What did Malthus and Ricardo say about the effects of population growth?

BIOGRAPHY

Adam Smith (1723–1790)

In his book *The Wealth of Nations*, Smith argued that if individuals freely followed their own self-interest, the world would be an orderly and progressive place. Social harmony would result without any government direction, "as if by an invisible hand."

Smith applied an invisible hand of his own. After his death, people discovered that he had secretly donated large sums of his income to charities.



The Rise of Socialism

Certain theorists had their own responses to both laissez-faire philosophy, which advised governments to leave business alone, and the rise of capitalism, which was emerging as the dominant economic system in the Western world. These thinkers believed that governments should intervene and that wealthy people or the government must take action to improve people's lives. The French writer Alexis de Tocqueville gave a warning:

“Consider what is happening among the working classes. . . . Do you not see spreading among them, little by little, opinions and ideas that aim not to overturn such and such a ministry, or such laws, or such a government, but society itself, to shake it to the foundations upon which it now rests?”

—Alexis de Tocqueville, 1848 speech

Utilitarianism English philosopher Jeremy Bentham modified the ideas of Adam Smith. Bentham introduced the philosophy of **utilitarianism** in the late 1700s, when he wrote his most influential works. According to Bentham's theory, people should judge ideas, institutions, and actions on the basis of their utility, or usefulness. He argued that the government should try to promote the greatest good for the greatest number of people. A government policy was only useful if it promoted this goal. Bentham believed that in general the individual should be free to pursue his or her own advantage without interference from the state.

John Stuart Mill, a philosopher and economist, led the utilitarian movement in the 1800s. Mill came to question unregulated capitalism. He believed it was wrong that workers should lead deprived lives that sometimes bordered on starvation. Mill wished to help ordinary working people with policies that would lead to a more equal division of profits. He also favored a cooperative system of agriculture and women's rights, including the right to vote. Mill called for the government to do away with great differences in wealth. Utilitarians also pushed for reforms in the legal and prison systems and in education.

Socialism French reformers such as Charles Fourier (FUR•ee•AY), Saint-Simon (san-see•MOHN), and others sought to offset the ill effects of industrialization with a new economic system called socialism. In **socialism**, the factors of production are owned by the public and operate for the welfare of all.

Socialism grew out of an optimistic view of human nature, a belief in progress, and a concern for social justice. Socialists argued that the government should plan the economy rather than depend on free-market capitalism to do the job. They argued that government control of factories, mines, railroads, and other key industries would end poverty and promote

equality. Public ownership, they believed, would help workers, who were at the mercy of their employers. Some socialists—such as Louis Blanc—advocated change through extension of the right to vote.

Utopianism Other reformers took an even more active approach. Shocked by the misery and poverty of the working class and looking to demonstrate socialist ideas, a British factory owner named Robert Owen improved working conditions for his employees. Near his cotton mill in New Lanark, Scotland, Owen built houses, which he rented at low rates. He prohibited children under ten from working in the mills and provided free schooling.

Then, in 1824, Owen traveled to the United States. He founded a cooperative community called New Harmony in Indiana, in 1825. He intended this community to be a utopia, or perfect living place. The belief that such communities can solve society's problems is called utopianism.

New Harmony exhibited social reforms by offering such things as a kindergarten and a free library. New Harmony lasted only three years but inspired the founding of other communities. Utopianism existed in various forms in these communities. Some were religiously based, and others had a more political purpose.

The efforts of Robert Owen and other people who believed in socialism led to a movement called social democracy. Those who advocated social democracy wanted to move from capitalism to socialism by democratic means.

Marxism: Radical Socialism

The writings of a German journalist named **Karl Marx** introduced the world to a radical type of socialism called Marxism. Marx and Friedrich Engels, a German whose father owned a textile mill in Manchester, outlined their ideas in a 23-page pamphlet called *The Communist Manifesto*.

Reading Check

Find Main Ideas

How did Mill want to change the economic system?

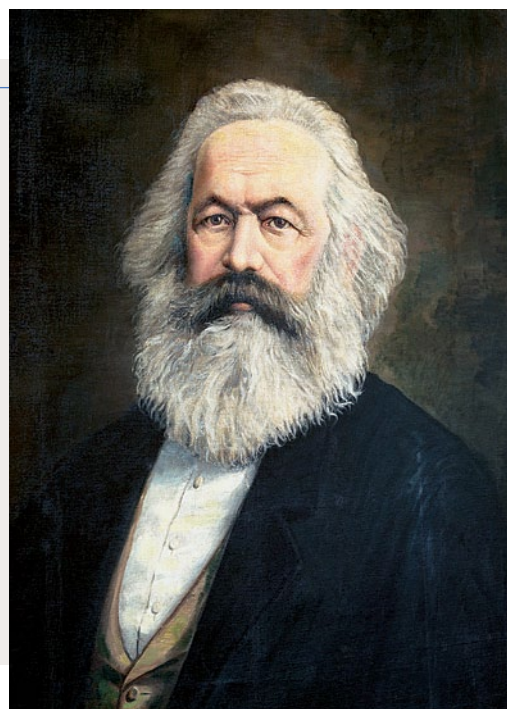
BIOGRAPHY

Karl Marx

(1818–1883)

Karl Marx studied philosophy at the University of Berlin before he turned to journalism and economics. In 1849, Marx joined the flood of radicals who fled continental Europe for England. He had declared in *The Communist Manifesto* that “the working men have no country.”

Marx's theories of socialism and the inevitable revolt of the working class made him little money. He earned a meager living as a journalist. His wealthy coauthor and fellow German, Friedrich Engels, gave Marx financial aid.



The Communist Manifesto In their manifesto, Marx and Engels argued that human societies have always been divided into warring classes. In their own time, these were the middle-class “haves” or employers, called the bourgeoisie (bur•zhwah•ZEE), and the “have-nots” or workers, called the proletariat (proh•lih•TAIR•ee•iht). While the wealthy controlled the means of producing goods, the poor performed backbreaking labor under terrible conditions. This situation resulted in conflict:

“Freeman and slave, patrician and plebeian, lord and serf, guild-master and journeyman, in a word, oppressor and oppressed, stood in constant opposition to one another, carried on an uninterrupted, now hidden, now open fight, a fight that each time ended, either in a revolutionary reconstitution of society at large, or in the common ruin of the contending classes.”

—Karl Marx and Friedrich Engels, *The Communist Manifesto* (1848)

According to Marx and Engels, the Industrial Revolution had enriched the wealthy and impoverished the poor. The two writers predicted that the workers would overthrow the owners: “The proletarians have nothing to lose but their chains. They have a world to win. Workingmen of all countries, unite.”

The Future According to Marx Marx believed that the capitalist system, which produced the Industrial Revolution, would eventually destroy itself in the following way. Factories would drive small artisans out of business, leaving a small number of manufacturers to control all the wealth. The large proletariat would revolt, seize the factories and mills from the capitalists, and produce what society needed. Workers, sharing in the profits, would bring about economic equality for all people. The workers would control the government in a “dictatorship of the proletariat.” After a period of cooperative living and education, the state or government would wither away as a classless society developed.

Marx called this final phase pure communism. Marx described **communism** as a form of complete socialism in which the means of production—all land, mines, factories, railroads, and businesses—would be owned by the people. Private property would in effect cease to exist. All goods and services would be shared equally.

Published in 1848, *The Communist Manifesto* produced few short-term results. Though widespread revolts shook Europe during 1848 and 1849, Europe’s leaders eventually put down the uprisings. Only after the turn of the century did the fiery Marxist pamphlet produce explosive results. In the 1900s, Marxism inspired revolutionaries such as Russia’s Lenin, China’s Mao Zedong, and Cuba’s Fidel Castro. These leaders adapted Marx’s beliefs to their own specific situations and needs.

Capitalism, Socialism, and Communism

The economic system called capitalism developed gradually over centuries, beginning in the late Middle Ages. Because of the ways industrialization changed society, some people began to think that capitalism led to certain problems, such as the abuse of workers. They responded by developing a new system of economic ideas called socialism. Communism was an even more radical form of socialism.

Capitalism	Socialism	Communism
Individuals and businesses own property and the means of production.	The public, in the form of the state, should own property and the means of production.	A community of workers controls the government, and the government controls the economy.
Progress results when individuals follow their own self-interest.	Progress results when a community of producers cooperate for the good of all.	Progress results when capitalism collapses and the people govern themselves. If capitalism is allowed to grow, eventually workers sink into poverty.
Government should not interfere in the economy because competition creates efficiency in business. Businesses follow their own self-interest by competing for the consumer's money. Each business tries to produce goods or services that are better and less expensive than those of competitors.	Socialists believe that capitalist employers take advantage of workers. The community or state must act to protect workers.	Communists seek to create a society based on cooperation and equal distribution of wealth.
Consumers compete to buy the best goods at the lowest prices. This competition shapes the market by affecting what businesses are able to sell.	Capitalism creates unequal distribution of wealth and material goods. A better system is to distribute goods according to each person's need.	A communist society is one that exists without class divisions.
Capitalism emerged in England out of the growth of that country's thriving, industrialized cloth industry.	Socialism thrived in France, where French thinkers expanded on optimistic Enlightenment ideals.	Communism first developed in Germany, where Marx and Engels criticized capitalism as it existed during the Industrial Revolution.

Interpret Charts

1. Develop Historical Perspective Consider the following people from 19th-century Britain: factory worker, shop owner, factory owner, unemployed artisan. Which of them would be most likely to prefer capitalism and which would prefer socialism? Why?

2. Form Opinions Which system of economic ideas seems most widespread today? Support your opinion.

In *The Communist Manifesto*, Marx and Engels stated their belief that economic forces alone dominated society. Time has shown, however, that religion, nationalism, ethnic loyalties, and a desire for democratic reforms may be as strong influences on history as economic forces. In addition, the gap between the rich and the poor within the industrialized countries failed to widen in the way that Marx and Engels predicted, mostly because of the various reforms enacted by governments.

Anarchism There was yet another political movement that gained traction during the Industrial Revolution, and that was anarchism. **Anarchism** argued that government actually hurt people and should be done away with entirely. Anarchists believed the people should be allowed to develop freely without any government interference whatsoever, and laws were, in and of themselves, oppressive and tyrannical.

Anarchism had a significant impact on European society in the late 19th century. There were major schools of anarchist thought in Britain, France, Russia, and Italy. An idealistic form of anarchism influenced some of the most prominent artists, writers, and thinkers of the age. However, some anarchist principles were taken too far. An alarming number of political assassinations and terrorist acts were carried out under the anarchist banner between 1890 and 1901, including the murders of King Umberto I of Italy and United States President William McKinley. These acts resulted in anarchism losing favor. In the early years of the 20th century, support for anarchism either moved into, or was destroyed by, rising communist and fascist movements.

Reading Check

Summarize

What were the ideas of Marx and Engels concerning relations between the owners and the working class?

Now and Then

Communism Today

Communism expanded to all parts of the world during the Cold War that followed the end of World War II. At the peak of Communist expansion in the 1980s, about 20 nations were Communist-controlled, including two of the world's largest—China and the Soviet Union. However, dissatisfaction with the theories of Karl Marx had been developing.

Eventually, most Communist governments were replaced. Today, there are only five Communist countries—China, North Korea, Vietnam, and Laos in Asia and Cuba in the Caribbean. Most of these nations, apart from North Korea, have largely abandoned communist economic principles.



Industrialization

Industrialization raised the standard of living for many people, yet the process also brought suffering to countless workers who crowded into filthy cities to toil for starvation wages.

The following primary sources reveal multiple perspectives on this major historical movement. Interpretations of historical movements are, by their nature, tentative, limited, and diverse. They are tentative in that they change over time. They are limited and diverse in that they arise from different people's particular frames of reference.

“One great advantage which America will have in competing in the markets of the world is that her manufacturers will have the best home market. Upon this they can depend for a return upon capital, and the surplus product can be exported with advantage, even when the prices received for it do no more than cover actual cost, provided the exports be charged with their proportion of all expenses. The nation that has the best home market, especially if products are standardized, as ours are, can soon outsell the foreign producer.”

Andrew Carnegie

Andrew Carnegie was a multimillionaire industrialist who acquired his fortune in the American steel industry. In his autobiography, published in 1920, he viewed with optimism the growth of American industry.

Walter Crane

Walter Crane was born in Liverpool in 1845. His illustrations were often published in socialist periodicals. This political cartoon from 1886 shows the vampire bat of capitalism attacking a laborer. Socialism is pictured as an angel who is coming to the rescue.

Analyze Historical Sources

Why would Carnegie and Engels disagree about industrialization's effects? Consider their frames of reference, their own limitations, and the different contexts in which they lived. Also, would Engels be a credible authority on the long-term effects of industrialization? Why or why not?

Perspectives on history should always be interpreted based upon the historical, economic, political, social, and geographic context of the participants.

The credibility, or believability, of the participants must be considered as well. For example, you might question the credibility of someone whose writing betrays a clear political bias. On the other hand, you may be likely to trust the perspective of someone who lived during the historical period in question.

“Nobody troubles about the poor as they struggle helplessly in the whirlpool of modern industrial life. The working man may be lucky enough to find employment, if by his labor he can enrich some member of the middle classes. But his wages are so low that they hardly keep body and soul together. If he cannot find work, he can steal, unless he is afraid of the police; or he can go hungry and then the police will see to it that he will die of hunger in such a way as not to disturb the equanimity of the middle classes.”

Friedrich Engels

German-born Friedrich Engels coauthored *The Communist Manifesto* and managed a textile factory in Manchester, England. The above excerpt is from his 1844 book, *The Condition of the Working Class in England*.



Labor Unions and Reform Laws

Factory workers faced long hours, dirty and dangerous working conditions, and the threat of being laid off. By the 1800s, working people became more active in politics. To press for reforms, workers joined together in voluntary labor associations called **unions**.

Unionization A union spoke for all the workers in a particular trade. Unions engaged in collective bargaining, negotiations between workers and their employers. They bargained for better working conditions and higher pay. If factory owners refused these demands, union members could **strike**, or refuse to work.

Skilled workers led the way in forming unions because their special skills gave them extra bargaining power. Management would have trouble replacing such skilled workers as carpenters, printers, and spinners. Thus, the earliest unions helped the lower middle class more than they helped the poorest workers.

The union movement underwent slow, painful growth in both Great Britain and the United States. For years, the British government denied workers the right to form unions. The government saw unions as a threat to social order and stability. Indeed, the Combination Acts of 1799 and 1800 outlawed unions and strikes. Ignoring the threat of jail or job loss, factory workers joined unions anyway. Parliament finally repealed the Combination Acts in 1824. After 1825, the British government unhappily tolerated unions.

Hungarian workers meet to plan their strategy before a strike.



British unions had shared goals of raising wages for their members and improving working conditions. By 1875, British trade unions had won the right to strike and picket peacefully. They had also built up a membership of about 1 million people.

In the United States, skilled workers had belonged to unions since the early 1800s. In 1886, several unions joined together to form the organization that would become the American Federation of Labor (AFL). A series of successful strikes won AFL members higher wages and shorter hours.

Reform Laws Eventually, reformers and unions forced political leaders to look into the abuses caused by industrialization. In both Great Britain and the United States, new laws reformed some of the worst abuses of

Reading Check

Summarize

What were some of the important reform bills passed in Britain during this period?

industrialization. In the 1820s and 1830s, for example, Parliament began investigating child labor and working conditions in factories and mines. As a result of its findings, Parliament passed the Factory Act of 1833. The new law made it illegal to hire children under nine years old. Children from the ages of 9 to 12 could not work more than eight hours a day. Young people from 13 to 17 could not work more than 12 hours. In 1842, the Mines Act prevented women and children from working underground.

In 1847, the Parliament passed a bill that helped working women as well as their children. The Ten Hours Act of 1847 limited the workday to ten hours for women and children who worked in factories.

Reformers in the United States also passed laws to protect child workers. In 1904, a group of progressive reformers organized the National Child Labor Committee to end child labor. Arguing that child labor lowered wages for all workers, union members joined the reformers. Together they pressured national and state politicians to ban child labor and set maximum working hours.

In 1919, the U.S. Supreme Court objected to a federal child labor law, ruling that it interfered with states' rights to regulate labor. However, individual states were allowed to limit the working hours of women and, later, of men.

The Reform Movement Spreads

Almost from the beginning, reform movements rose in response to the negative impact of industrialization. These reforms included social reforms, such as improving the workplace, and democratic reforms, like extending the right to vote to working-class men. The same impulse toward reform, along with the ideals of the French Revolution, also helped to end slavery and promote new rights for women and children.

The Abolition of Slavery William Wilberforce, a highly religious man, was a member of Parliament who led the fight for abolition—the end of the slave trade and slavery in the British Empire. Parliament passed a bill to end the slave trade in the British West Indies in 1807. After he retired from Parliament in 1825, Wilberforce continued his fight to free the slaves. Britain finally abolished slavery in its empire in 1833.

British antislavery activists had mixed motives. Some, such as the abolitionist Wilberforce, were morally against slavery. Others viewed slave labor as an economic threat. Furthermore, a new class of industrialists developed who supported cheap labor rather than slave labor. They soon gained power in Parliament.

In the United States, the movement to fulfill the promise of the Declaration of Independence by ending slavery grew in the early 1800s. The enslavement of African people finally ended in the United States when the Union won the Civil War in 1865. Then, enslavement persisted in the Americas only in Puerto Rico, Cuba, and Brazil. In Puerto Rico, slavery was ended in 1873. Spain finally abolished slavery in its Cuban colony in 1886. Not until 1888 did Brazil's huge enslaved population win freedom.

The Fight for Women’s Rights The Industrial Revolution—and its resulting urbanization—proved a mixed blessing for women. On the one hand, factory work offered higher wages than work done at home. Women spinners in Manchester, for example, earned much more money than women who stayed home to spin cotton thread. On the other hand, women factory workers usually made only one-third as much money as men did.

Women led reform movements to address this and other pressing social issues. During the mid-1800s, for example, women formed unions in the trades where they dominated. In Britain, some women served as safety inspectors in factories where other women worked. In the United States, college-educated women like Jane Addams ran settlement houses. These community centers served the poor residents of slum neighborhoods.

In both the United States and Britain, women who had rallied for the abolition of slavery began to wonder why their own rights should be denied on the basis of gender. The movement for women’s rights began in the United States as early as 1848. Women activists around the world joined to found the International Council for Women in 1888. Delegates and observers from 27 countries attended the council’s 1899 meeting.

Democratic Reforms in Britain As Britain’s economy expanded and its cities grew, members of the British middle class expected to have more say in how their government operated. The policies of Parliament should reflect the people’s interests, it was believed. Beginning in the 1830s, a series of democratic reforms expanded, or improved, voting in Britain. The 1832 Reform Bill expanded voting rights to middle-class men living in industrial towns. Another act in 1867 gave the vote to working-class men.

BIOGRAPHY

Jane Addams

(1860–1935)

After graduating from college, Jane Addams wondered what to do with her life:

“I gradually became convinced that it would be a good thing to rent a house in a part of the city where many primitive and actual needs are found, in which young women who had been given over too exclusively to study, might . . . learn of life from life itself.”

Addams and her friend Ellen Starr set up Hull House in a working-class district in Chicago. Eventually the facilities included a nursery, a gym, a kitchen, and a boarding house for working women. Hull House not only served the immigrant population of the neighborhood, but it also trained social workers.



Voting by secret ballot was introduced in 1872, and a Third Reform Bill, in 1884–1885, brought agricultural workers into the democratic process. Full suffrage for men would come in 1918. However, full voting rights for British women over the age of 21 would not arrive until 1928.

Reforms Spread to Many Areas of Life In the United States and Western Europe, reformers tried to correct the problems troubling the newly industrialized nations. Public education and prison reform ranked high on the reformers' lists.

One of the most prominent U.S. reformers, Horace Mann of Massachusetts, favored free public education for all children. Mann, who spent his own childhood working at hard labor, warned, "If we do not prepare children to become good citizens . . . if we do not enrich their minds with knowledge, then our republic must go down to destruction." By the 1850s, many states were starting public school systems. In Western Europe, free public schooling became available in the late 1800s.

In 1831, French writer Alexis de Tocqueville had contrasted the brutal conditions in American prisons to the "extended liberty" of American society. Those who sought to reform prisons emphasized the goal of providing prisoners with the means to lead to useful lives upon release.

During the 1800s, democracy grew in industrialized countries even as foreign expansion increased. The industrialized democracies faced new challenges both at home and abroad.

Reading Check

Make Inferences
Why might women abolitionists have headed the movement for women's rights?

Lesson 4 Assessment

1. **Organize Information** Create a two-column graphic organizer similar to the one shown and fill it in with characteristics of capitalism and socialism. What characteristic do capitalism and socialism share?

Capitalism	Socialism
1. 2. 3.	1. 2. 3.

2. **Key Terms and People** For each key term or person in the lesson, write a sentence explaining its significance.
3. **Synthesize** What were Adam Smith's three natural laws of economics?
4. **Analyze Causes** Why did workers join together in unions?
5. **Identify Problems** What were the main problems faced by the unions during the 1800s and how did they overcome them?
6. **Make Inferences** Why did the labor reform movement spread to other areas of life?

Module 21 Assessment

Key Terms and People

For each term or name below, briefly explain its connection to the Industrial Revolution.

1. Industrial Revolution
2. enclosure
3. factory
4. urbanization
5. middle class
6. corporation
7. laissez faire
8. socialism
9. Karl Marx
10. union

Main Ideas

Use your notes and information in the module to answer the following questions.

The Beginnings of Industrialization

1. What were the four natural resources needed for British industrialization?
2. How did the enclosure movement change agriculture in England?
3. What were two important inventions created during the Industrial Revolution? Describe their impact.

Case Study: Industrialization

4. What were the living conditions like in Britain during industrialization?
5. How did the new middle class transform the social structure of Britain during industrialization?
6. How did industrialization affect Manchester's natural environment?

Industrialization Spreads

7. Why were other European countries slower to industrialize than Britain?
8. What might explain the rise of global inequality during the Industrial Revolution?

Reforming the Industrial World

9. What were the two warring classes that Marx and Engels outlined in *The Communist Manifesto*?
10. How did women fight for change during the Industrial Revolution?

Module 21 Assessment, continued

Critical Thinking

1. **Synthesize** In a chart, list some of the major technological advances and their effects on society.
2. **Evaluate** How significant were the changes that the Industrial Revolution brought to the world? Explain your conclusion.
3. **Analyze Causes and Effects** How important were labor unions in increasing the power of workers? Give reasons for your opinion.
4. **Draw Conclusions** How did the Industrial Revolution help to increase Germany's military power? Support your answer with information from the module.
5. **Develop Historical Perspective** Would a non-industrialized or an industrialized nation more likely be an empire builder? Why?
6. **Synthesize** Use the Internet to find a recent news article or opinion piece about the working conditions of industrial workers today. Which primary source author does the perspective of the present-day writer support? How does the present-day writer's perspective shape your interpretation of the issue, generally?

Engage with History

Imagine that you are a 15-year-old living in Britain where the Industrial Revolution has spurred the growth of numerous factories. Would you attempt to change your working conditions in the factory? What working conditions would you change? What benefits and disadvantages might a union bring? Discuss these questions in small groups.

Focus on Writing

During and after the Industrial Revolution, capitalism emerged as the dominant economic system in the Western world. Write an **informative essay** analyzing how this occurred and how people responded to it, including such reform philosophies as utopianism, social democracy, socialism, and communism.

Multimedia Activity

Make a list of five major inventions or innovations of the Industrial Revolution. Research each to learn about the scientific, economic, and social changes that contributed to its development and the effects that it caused. Use the Internet, books, and other resources to conduct your research. Then use graphics software to create a chart, graph, or diagram depicting the relationship between the inventions and innovations, the changes, and the effects.

You may include some of the following:

- the plow
- the power loom
- the sewing machine
- the cotton gin
- the spinning jenny

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