

SECTION 2 Step-by-Step Instruction

Objectives

As you teach this section, keep students focused on the following objectives to help them answer the Section Focus Question and master core content.

- Understand why Britain was the starting point for the Industrial Revolution.
- Describe the changes that transformed the textile industry.
- Explain the significance of the transportation revolution.

Prepare to Read

Build Background Knowledge L3

Ask students to recall which of the events leading to the Industrial Revolution took place in Britain. (*steam engine, improved iron*) Then ask them to predict why Britain took the lead in the Industrial Revolution.

Set a Purpose L3

- **WITNESS HISTORY** Read the selection aloud or play the audio.

 **Witness History Audio CD, Riding the Railway**

Ask **Why did the ride seem so strange to Fanny Kemble?** (*There was no animal pulling them along—just a machine.*) Ask students to predict why railways would be such an important development.

- **Focus** Point out the Section Focus Question and write it on the board. Tell students to refer to this question as they read. (*Answer appears with Section 2 Assessment answers.*)
 - **Preview** Have students preview the Section Objectives and the list of Terms, People, and Places.
 - **Note Taking** Have students read this section using the Structured Read Aloud strategy (TE, p. T20). As they read, have students fill in the concept web showing factors that led to Britain's early lead in industry.
-  **Reading and Note Taking Study Guide, p. 175**

SECTION 2

Train passengers in Britain



Early train ticket



WITNESS HISTORY AUDIO

Riding the Railway

One of the most important developments of the Industrial Revolution was the creation of a countrywide railway network. The world's first major rail line went from Liverpool to Manchester in England. Fanny Kemble, the most famous actress of the day, was one of the first passengers:

“We were introduced to the little engine which was to drag us along the rails. . . This snorting little animal, . . . started at about ten miles an hour. . . You can't imagine how strange it seemed to be journeying on thus, without any visible cause of progress other than the magical machine. . .”

Focus Question What key factors allowed Britain to lead the way in the Industrial Revolution?

Britain Leads the Way

Objectives

- Understand why Britain was the starting point for the Industrial Revolution.
- Describe the changes that transformed the textile industry.
- Explain the significance of the transportation revolution.

Terms, People, and Places

capital	Eli Whitney
enterprise	turnpike
entrepreneur	Liverpool
putting-out system	Manchester

Note Taking

Reading Skill: Identify Causes and Effects Fill in the circles of a concept web like the one below with the key factors that helped Britain take an early lead in industrialization. In a separate concept web, fill in the effects of Britain's early lead.



When agricultural practices changed in the eighteenth century, more food was able to be produced, which in turn fueled population growth in Britain. The agricultural changes also left many farmers homeless and jobless. These two factors led to a population boom in the cities as people migrated from rural England into towns and cities. This population increase, in turn, created a ready supply of labor to mine the coal, build the factories, and run the machines. The start of the Industrial Revolution in Britain can be attributed to many factors. Population growth was just one of them.

Why Britain?

What characteristics of eighteenth-century Britain made it ripe for industrialization? Historians cite several reasons for Britain's lead.

Natural Resources Abound Britain had the advantage of plentiful natural resources such as natural ports and navigable rivers. Rivers supplied water power and allowed for the construction of canals. These canals increased accessibility for trade and were instrumental in bringing goods to market. In addition, Britain was able to establish communications and transport relatively cheaply due to its easy accessibility to the sea from all points. Britain's plentiful supply of coal was fundamental to its industrialization and was used to power steam engines. Vast supplies of iron were available to be used to build the new machines.

Vocabulary Builder

Use the information below and the following resources to teach the high-use word from this section.

 **Teaching Resources, Unit 4, p. 45; Teaching Resources, Skills Handbook, p. 3**

High-Use Word
decade, p. 615

Definition and Sample Sentence

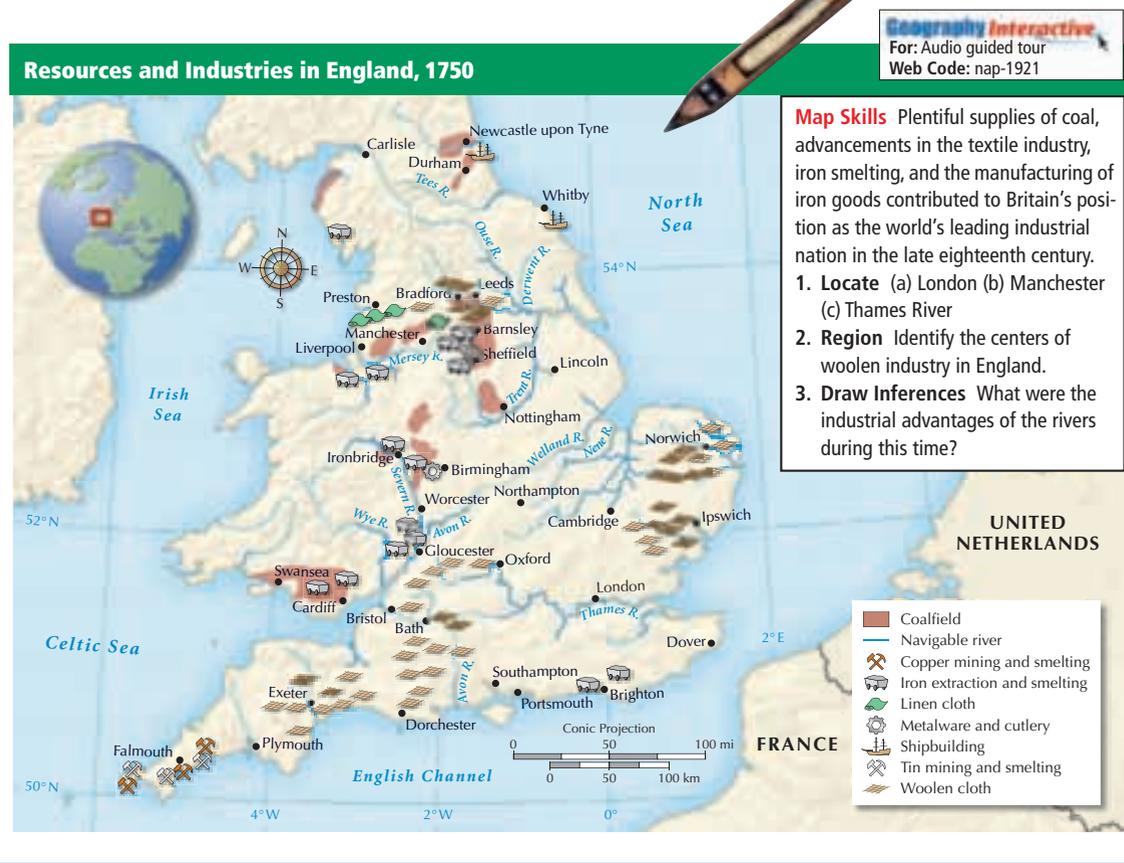
n. ten-year periods
In the **decade** from 1990 to 2000, the world witnessed a technological revolution led by the Internet.

The Effects of Demand and Capital In the 1700s, Britain had plenty of skilled mechanics who were eager to meet the growing demand for new, practical inventions. This ready workforce, along with the population explosion, boosted demand for goods. In order to increase the production of goods to meet the demand, however, another key ingredient was needed. Money was necessary to start businesses.

From the mid-1600s to 1700s, trade from a growing overseas empire helped the British economy prosper. Beginning with the slave trade, the business class accumulated **capital**, or money used to invest in enterprises. An **enterprise** is a business organization in an area such as shipping, mining, railroads, or factories. Many businessmen were ready to risk their capital in new ventures due to the healthy economy.

In addition to the advantages already cited, Britain had a stable government that supported economic growth. While other countries in Europe faced river tolls and other barriers, Britain did not. The government built a strong navy that protected its empire, shipping, and overseas trade. Although the upper class tended to look down on business people, it did not reject the wealth produced by the new entrepreneurs. These **entrepreneurs** were those who managed and assumed the financial risks of starting new businesses.

✓ Checkpoint What conditions in Britain paved the way for the Industrial Revolution?



Teach

Why Britain?

L3

Instruct

- **Introduce: Key Terms** Ask students to find the key term **entrepreneurs** (in blue) in the text and define it. Then ask what kinds of social and political conditions are favorable to entrepreneurs and new technology.
- **Teach** Discuss Britain's resources. Use the Numbered Heads strategy (TE, p. T23) and ask students to define **capital**. Ask **Where did British entrepreneurs get capital? (from trade) With whom did the British trade? (America, Canada, the Caribbean, Africa, India, China, the East Indies, Egypt) What were some of the items traded? (slaves, cotton, rum, tobacco, gold, tea, spices)** Then ask them to recall what mercantilism was and how it benefited Britain.

- **Quick Activity** Have students access **Web Code nap-1921** to take the **Geography Interactive Audio Guided Tour** and then answer the map skills questions in the text.

Independent Practice

Have students fill in the Outline Map *Industrial Cities in Great Britain and Ireland, 1800–1850*.

All in One Teaching Resources, Unit 4, p. 52

Monitor Progress

- As students fill in their concept webs, circulate to make sure they distinguish major and minor factors. For a completed version of the concept web, see **Note Taking Transparencies, 141**
- Circulate to make sure students are filling in their Outline Maps accurately. Administer the Geography Quiz.

All in One Teaching Resources, Unit 4, p. 53

Differentiated

Instruction Solutions for All Learners

- L1** Special Needs **L2** English Language Learners **L2** Less Proficient Readers

To help students with the key term *enterprise*, have them plan what they would need to start their own enterprise such as a T-shirt company. Use their ideas to create a concept web to show the enterprise. Be sure to include capital, labor, technology, raw materials, and transportation to market. For each item, ask students to suggest a specific example.

Use the following resources to help students acquire basic skills:

Adapted Reading and Note Taking Study Guide

- Adapted Note Taking Study Guide, p. 175
- Adapted Section Summary, p. 176

Answers

- ✓ Britain's natural and human resources, technological lead, demand for goods due to increased population, access to capital, and social and political conditions

Map Skills

1. Review locations with students.
2. Norwich, Ipswich, Exeter
3. Rivers were used to transport goods to and from factories and as power sources.

The Textile Industry/The Transportation Revolution **L3**

Instruct

■ Introduce: Vocabulary Builder

Have students read the Vocabulary Builder term and definition. Have students scan the text and identify the respective **decades** in which the spinning jenny and cotton gin were invented. (1760s, 1790s) Point out that the Industrial Revolution triggered a chain reaction in which key changes occurred in decades instead of centuries.

- **Teach** Display **Color Transparency 115: British Cotton Imports and Exports, About 1840**. Ask **Which invention most affected imports?** (*cotton gin*) **Which inventions most affected exports?** (*flying shuttle, spinning jenny, water frame, factory*) **How did more British imports affect slavery in America?** (*To grow more cotton to export, planters bought more land and slaves, causing the economy to depend on slave labor.*)

 **Color Transparencies, 115**

- **Quick Activity** Display **Color Transparency 113: Canals in Britain, 1800**. Ask students to trace various routes and ask **What was shipped on the canals?** (*coal, raw materials, finished textiles*) **What replaced the canals?** (*railroads*) Then display **Color Transparency 114: The Growth of Railways in Great Britain, 1840 and 1850**. Ask **Why was the route from Liverpool to Manchester so vital?** (*Liverpool was a key port; Manchester was a key industrial city.*) Have students compare the two maps. Which routes were important on both? Why?

 **Color Transparencies, 113 and 114**

Independent Practice

Have students, working in pairs, develop a script for a tour of the early textile factories and workshops of the Industrial Revolution.

Monitor Progress

Check Reading and Note Taking Study Guide entries for student understanding.

Answers

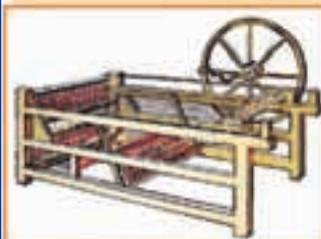
Caption They made it more productive because things were being done much faster.

- ✓ inventions that increased production and the creation of factories

British Textile Inventions

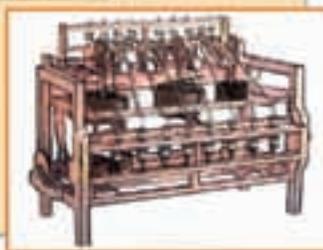
These textile machines were constructed to increase cotton production. The flying shuttle sped up weaving, while the spinning jenny and the water frame increased the speed of spinning thread. How did these inventions change the textile industry?

John Kay's flying shuttle, 1733 ▶



◀ James Hargreaves' spinning jenny, 1764

Richard Arkwright's water frame, 1769 ▶



The Textile Industry Advances

The Industrial Revolution first took hold in Britain's largest industry—textiles. In the 1600s, cotton cloth imported from India had become popular. British merchants tried to organize a cotton cloth industry at home. They developed the **putting-out system**, also known as cottage industry, in which raw cotton was distributed to peasant families who spun it into thread and then wove the thread into cloth in their own homes. Skilled artisans in the towns then finished and dyed the cloth.

Inventions Speed Production Under the putting-out system, production was slow. As the demand for cloth grew, inventors came up with a string of remarkable devices that revolutionized the British textile industry. For example, John Kay's flying shuttle enabled weavers to work so fast that they soon outpaced spinners. James Hargreaves solved that problem by producing the spinning jenny in 1764, which spun many threads at the same time. A few years later, in 1769, Richard Arkwright patented the water frame, which was a spinning machine that could be powered by water.

Meanwhile, in America, these faster spinning and weaving machines presented a challenge—how to produce enough cotton to keep up with England. Raw cotton grown in the South had to be cleaned of dirt and seeds by hand, a time-consuming task. To solve this, **Eli Whitney** invented a machine called the cotton gin that separated the seeds from the raw cotton at a fast rate. He finished the cotton gin in 1793, and cotton production increased exponentially.

Factories Are Born in Britain The new machines doomed the putting-out system. They were too large and expensive to be operated at home. Instead, manufacturers built long sheds to house the machines. At first, they located the sheds near rapidly moving streams, harnessing the water power to run the machines. Later, machines were powered by steam engines.

Spinners and weavers now came each day to work in these first factories, which brought together workers and machines to produce large quantities of goods. Early observers were awed at the size and output of these establishments. One onlooker noted: "The same [amount] of labor is now performed in one of these structures which formerly occupied the industry of an entire district."

- ✓ **Checkpoint** What led to the advancement of the British textile industry?

The Transportation Revolution

As production increased, entrepreneurs needed faster and cheaper methods of moving goods from place to place. Some capitalists invested in **turnpikes**, private roads built by entrepreneurs who charged travelers a toll, or fee, to use them. Goods traveled faster as a result, and turnpikes

Careers

Engineer The people who create cutting-edge inventions that improve our lives are often engineers. Engineers apply science to designing products or processes that are useful to society. The engineering field is divided into four main branches: civil, electrical, mechanical, and chemical. Civil engineers build dams, bridges, highways, large buildings, and power plants. Electrical engineers create everything from computers and electronics to missile guidance systems.

Mechanical engineers work on engines, machinery, air conditioning and heating, automobiles, airplanes, and spacecraft. Chemical engineers help protect the environment and create products such as medicines, plastics, synthetic fibers, metals, and food. There are many other specialties. Engineering requires good math skills, mechanical ability, and an interest in taking things apart and solving problems.

soon linked every part of Britain. Other entrepreneurs had canals dug to connect rivers together or to connect inland towns with coastal ports. Engineers also built stronger bridges and upgraded harbors to help the expanding overseas trade.

Canals Boom During the late 1700s and early 1800s, factories needed an efficient, inexpensive way to receive coal and raw materials and then to ship finished goods to market. In 1763, when the Bridgewater canal opened, it not only made a profit from tolls, but it cut in half the price of coal in Manchester. The success of this canal set off a canal-building frenzy. Entrepreneurs formed companies to construct canals for profit. Not all the canals that were built had enough traffic to support them, however, and bankruptcy often resulted. Then, beginning in the 1830s, canals lost their importance as steam locomotives made railroads the new preferred form of transportation.

Welcome the Steam Locomotive It was the invention of the steam locomotive that made the growth of railroads possible. In the early 1800s, pioneers like George Stephenson developed steam-powered locomotives to pull carriages along iron rails. The railroad did not have to follow the course of a river. This meant that tracks could go places where rivers did not, allowing factory owners and merchants to ship goods swiftly and cheaply over land. The world's first major rail line, from **Liverpool** to **Manchester**, opened in England in 1825. In the following **decades**, railroad travel became faster and railroad building boomed. By 1870, rail lines crisscrossed Britain, Europe, and North America.

One Thing Leads to Another As the Industrial Revolution got under way, it triggered a chain reaction. Once inventors developed machines that could produce large quantities of goods more efficiently, prices fell. Lower prices made goods more affordable and thus created more consumers who further fed the demand for goods. This new cycle caused a wave of economic and social changes that dramatically affected the way people lived.

 **Checkpoint** Why was the development of railroads important to industrialization?

Vocabulary Builder

decades—(DEK aydz) *n.* ten-year periods

Assess and Reteach

Assess Progress

L3

- Have students complete the Section Assessment.
- Administer the Section Quiz.

 **Teaching Resources, Unit 4, p. 42**

- To further assess student understanding, use  **Progress Monitoring Transparencies, 80**

Reteach

If students need more instruction, have them read the section summary.

 **Reading and Note Taking Study Guide, p. 176**

L3

 **Adapted Reading and Note Taking Study Guide, p. 176**

L1

L2

 **Spanish Reading and Note Taking Study Guide, p. 176**

L2

Extend

L4

See this Chapter's Professional Development pages for the Extend Online activity on the transportation revolution.

Answer

-  They allowed factory owners to ship raw materials and products quickly over land, not just by water.

2 Assessment

Terms, People, and Places

1. For each term, person, or place listed at the beginning of the section, write a sentence explaining its significance.

Note Taking

2. **Reading Skill: Identify Causes and Effects** Use your completed concept webs to answer the Focus Question: What key factors allowed Britain to lead the way in the Industrial Revolution?

Comprehension and Critical Thinking

3. **Analyze Information** Explain how each of the following helped contribute to demand for consumer goods in Britain: (a) population explosion, (b) general economic prosperity.
4. **Determine Relevance** What was the significance of new machines to the textile industry?
5. **Summarize** Explain how advances in transportation contributed to Britain's global trade.

Progress Monitoring Online

For: Self-quiz with vocabulary practice
Web Code: naa-1921

Writing About History

Quick Write: Create a Flowchart Flowcharts are useful tools to help you write an explanatory essay. Create a flowchart to show the changes that occurred in the textile industry. Be sure that the sequence of events is clear.

Section 2 Assessment

1. Sentences should reflect an understanding of each term, person, or place listed at the beginning of the section.
2. natural and human resources, technological inventions, demand for goods due to increased population, access to capital, social and political conditions, creation of factories, and better transportation
3. (a) As population grew, demand increased because there were more people who needed more goods. (b) As people became more prosperous, they had more money to buy goods.
4. The new machines were faster and greatly increased production. Their size and expense led to the creation of factories, which increased production further.
5. Railroads allowed transportation over land, and steamships improved transportation

over water, making it faster, cheaper, and easier to reach global markets.

Writing About History

Responses should show a clear sequence of events and demonstrate how each change led to problems that led to the next change.

For additional assessment, have students access **Progress Monitoring Online** at **Web Code naa-1921**.