



What You Will Learn...

Main Ideas

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

The Big Idea

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

Key Terms and People

Transportation Revolution, p. 396

Robert Fulton, p. 397

Clermont, p. 397

Gibbons v. Ogden, p. 397

Peter Cooper, p. 398



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TAKING NOTES

Use the graphic organizer online to create a time line with the key events in the development of transportation.

The Transportation Revolution

If YOU were there...

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

How would the railroad change your life?

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

Trade and Daily Life

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

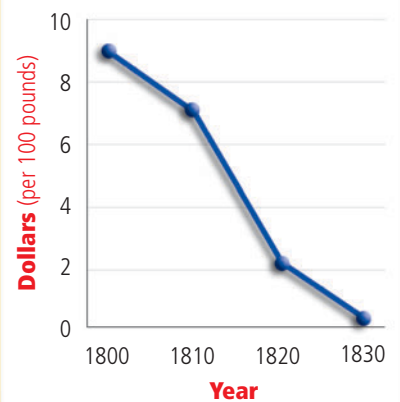
These improvements were made possible largely by the invention of two new forms of transportation: the steamboat and steam-powered trains. They enabled goods, people, and information to travel rapidly and efficiently across the United States. Suddenly people across the nation could buy manufactured items and even food products unavailable to them before. This boosted industry and agriculture, which created a need for more labor. In the North this meant that more people could find jobs in factories. In the South, slavery became even more important to support the



Mississippi River Steamboats

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

Upstream River Rates



economy. Steam-powered ships soon connected the United States with European markets, spurring the economy even more.

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

Steamboats

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

Steamboat Era

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

The steamboat was well suited for river travel. It could move upriver and did not rely on wind power. Steamboats increased trade

and profits because goods could be moved quickly and thus more cheaply. More than 500 steamboats were in use in the United States by 1840. By the 1850s, steamboats were also being used to carry people and goods across the Atlantic Ocean.

Gibbons v. Ogden

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

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

overnight there were many more shipping companies traveling the waterways. Competition between the businesses brought prices down, and more people could afford to buy the products brought to their local markets.

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

American Railroads

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

per, victory was spoiled when *Tom Thumb* broke down and lost the race near the end.

Despite the defeat, the contest showed the power and speed of even a small locomotive. Railroad fever soon spread. By 1840 railroad companies had laid about 2,800 miles of track—more than existed in all of Europe. French economist Michel Chevalier described Americans as having “a perfect passion for railroads.”

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

By 1860 about 30,000 miles of railroad linked almost every major city in the eastern United States. As a result, the economy surged forward. For example, American loco-



VIDEO

Wild West Tech:
Train Tech

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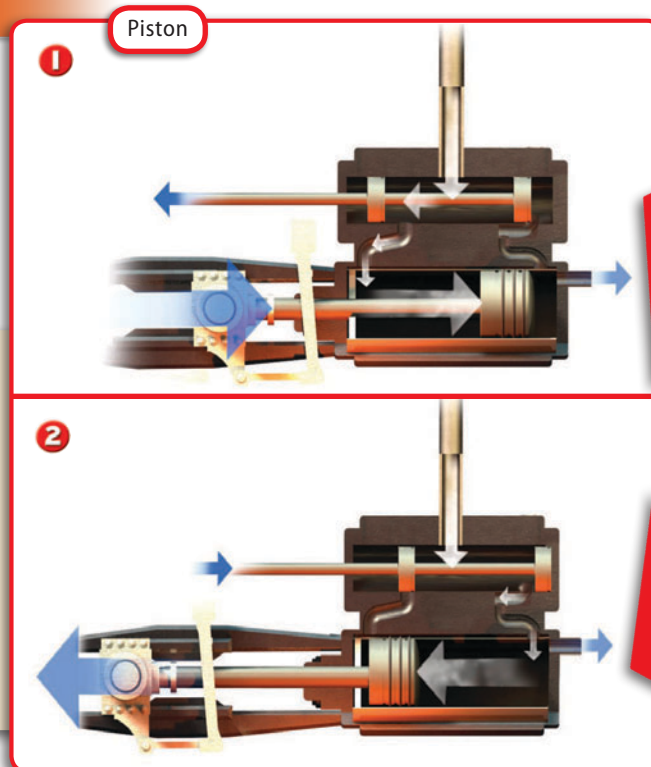
The Steam Train

CONNECT TO SCIENCE AND TECHNOLOGY

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

Why does the train have a firebox?

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



motives hauled more freight than those in any other country. The railroad companies quickly became some of the most powerful businesses in the nation. As the railroad system grew, manufacturers and farmers could send their goods to distant markets.

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

“Whizzing and rattling and panting, with its fiery furnace gleaming in front, its chimney vomiting fiery smoke above, and its long train of cars rushing along behind like the body and tail of a

gigantic dragon— . . . and all darting forward at the rate of twenty miles an hour. Whew!”

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

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

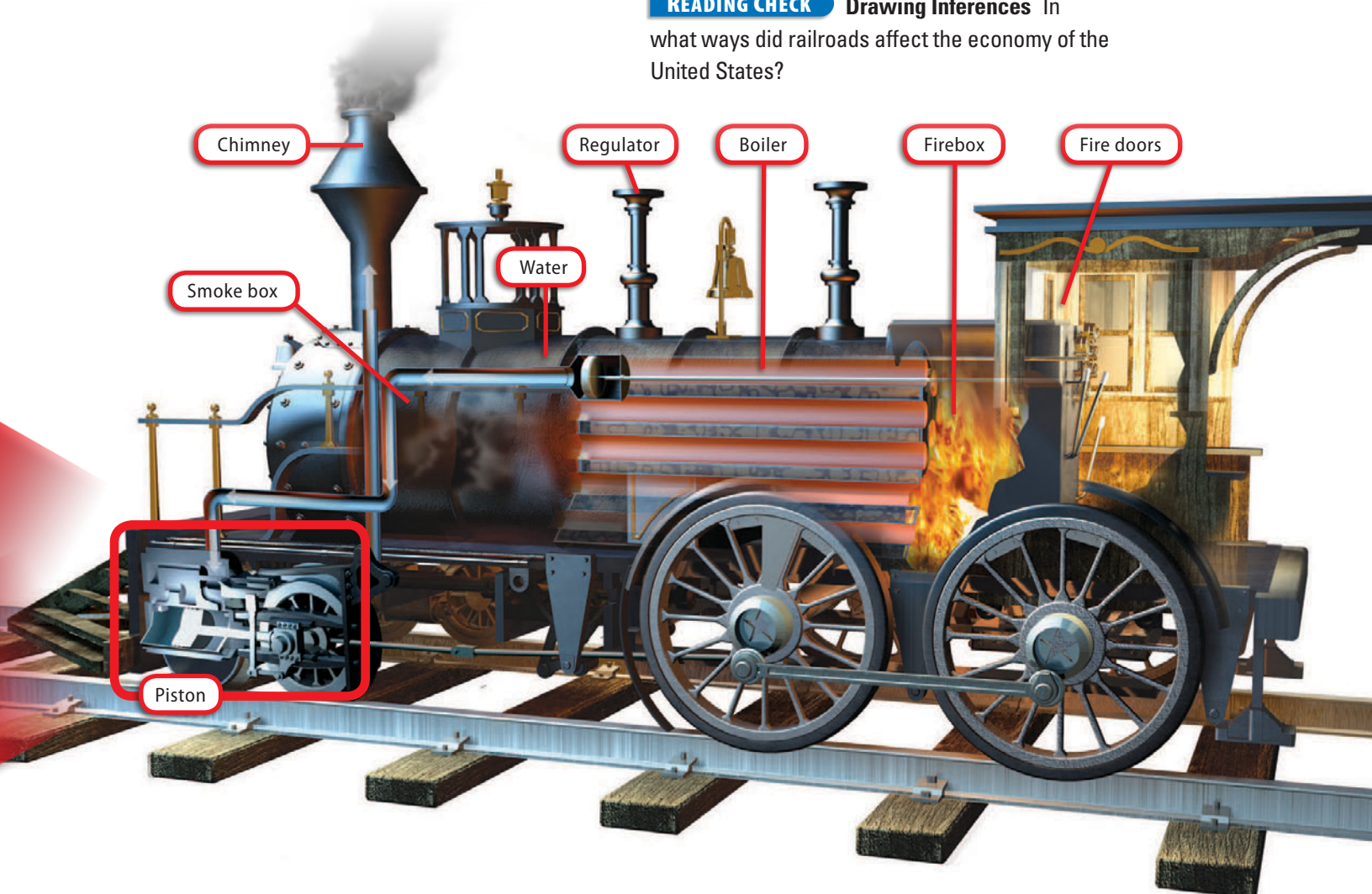
Passengers accepted such risks because the railroads reduced travel time dramatically. Railroads also helped tie communities together. In 1847 Senator Daniel Webster spoke for many people in the United States when he declared that the railroad “towers above all other inventions of this or the preceding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

THE IMPACT TODAY

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

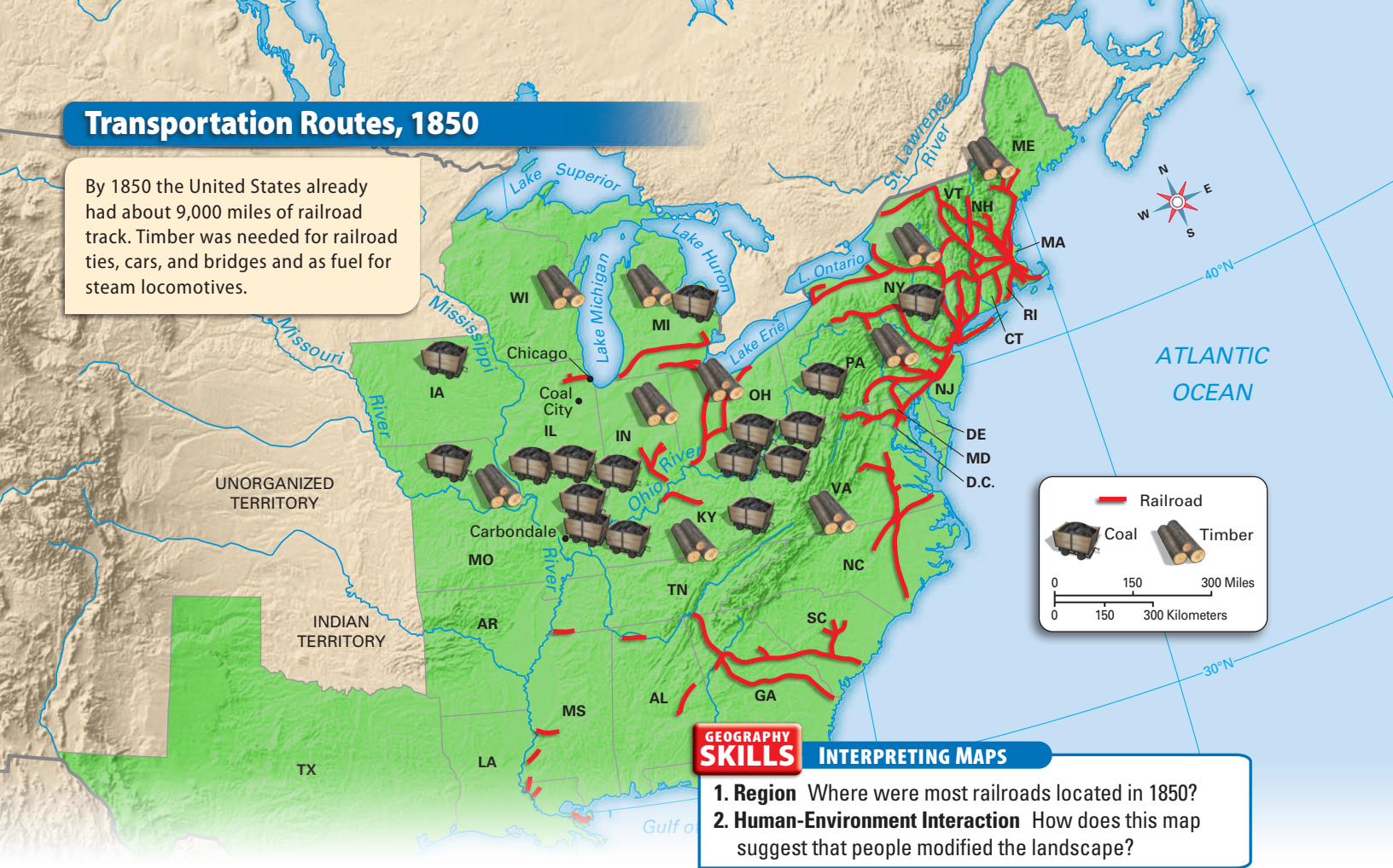
READING CHECK Drawing Inferences In

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



Transportation Routes, 1850

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



Transportation Revolution Brings Changes

The Transportation Revolution brought many changes to America. Steamboats and railroads made getting goods to distant markets much easier and less costly. International markets expanded, and Europe began to rely on southern cotton for its textile industry. People in all areas of the nation now had access to products made and grown far away. More than ever before, there was a national economy. The wealth, however, was centered in the North. The structure of the economy adjusted with the increase in availability of goods. The relationship between customers, business owners, and workers changed as people had more money to buy an increased selection of items. Both factory and agricultural workers were able to call for higher wages.

Railroads contributed to the expansion of the borders of the nation and guided

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

A New Fuel

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

As the demand for coal increased, a coal-mining industry developed in many states, including Pennsylvania, western Virginia, and Illinois. Coal mining changed the landscape in a number of ways. New towns, such as Coal City and Carbondale in Illinois, sprang up in places where coal deposits could be mined. Miners made deep gashes in the earth removing the coal.

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

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

Effects of Railroads

The railroads also played a role in the growth of other businesses. The logging industry expanded as people in the growing towns and cities needed wood for houses and furniture. Lumber items became the primary product of New England. Settlers spreading out across the Midwest cut down trees and plowed up prairies to make farmland. Deforestation, or cutting down and removing trees, took place on a large scale.

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

FOCUS ON READING

What causes and effects do you see in this section?

READING CHECK Analyzing Information

What role did railroads play in the coal industry?

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

Section 3 Assessment



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ONLINE QUIZ

Reviewing Ideas, Terms, and People

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

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

b. Analyze Summarize the issues behind *Gibbons v. Ogden*, what the decision was, and the significance of the decision. What effect did the ruling have on federal government?
- a. Describe** What event showed the power and speed of locomotives?

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

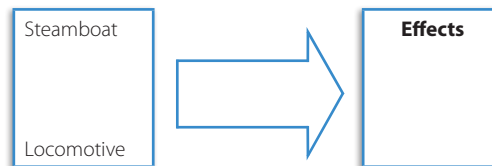
c. Elaborate Why do you think Americans were fascinated by railroads?
- a. Describe** What physical obstacles did railroad construction in the United States face?

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

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

Critical Thinking

- 5. Identifying Effects** Review your time line on the steamboat and the locomotive. Then copy the chart below and use it to show how they affected business, travel, and communication in the United States.



FOCUS ON WRITING

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