

Genre Informational Text

Essential Questions

How did the Transcontinental Railroad unite the country? What other feats of engineering have made America great?

Building the TRANSCONTINENTAL RAILROAD

by Samantha Paterson



AT 12:47 P.M. ON MAY 10, 1869, a ceremonial golden spike was pounded into a new railroad track at Promontory Summit in Utah. Seconds later, a telegram was sent across the United States. It had only one word: “Done.”

The construction of the Transcontinental Railroad was finally complete. America celebrated! After decades of planning and years of building, railroad tracks now crossed the North American continent and joined the eastern and western parts of the United States. It was one of the greatest engineering feats of the 19th century and forever changed life in America.

The BEGINNING

Before railroads, transportation in most of the United States and its territories was difficult. People traveled on foot, horseback, wagons pulled by horses, or boats and ships on rivers and canals. There was constant improvement in travel as more canals and better roads were built, but it was obvious that more needed to be done. America could not prosper without an elaborate rail system.

The story of the Transcontinental Railroad starts with the invention of the first steam locomotives to carry passengers in England in 1825. Five years later, locomotives made their way to America, and pulled trains on regular runs in the United States. The first runs were very short, covering only a handful of miles.

Eventually, more locomotives and more tracks were built. Trains connected cities and states that were hundreds of miles apart in the East. While railroads were growing, the United States was also growing. Decade by decade, its geographic size and population increased due to westward expansion and immigration.

In 1848, gold was discovered in the territory of California. Two years later, California became a state. Within the next fifteen years, three more states—Oregon, Kansas, and Nevada—joined the union.

NEED FOR A

TRANSCONTINENTAL RAILROAD

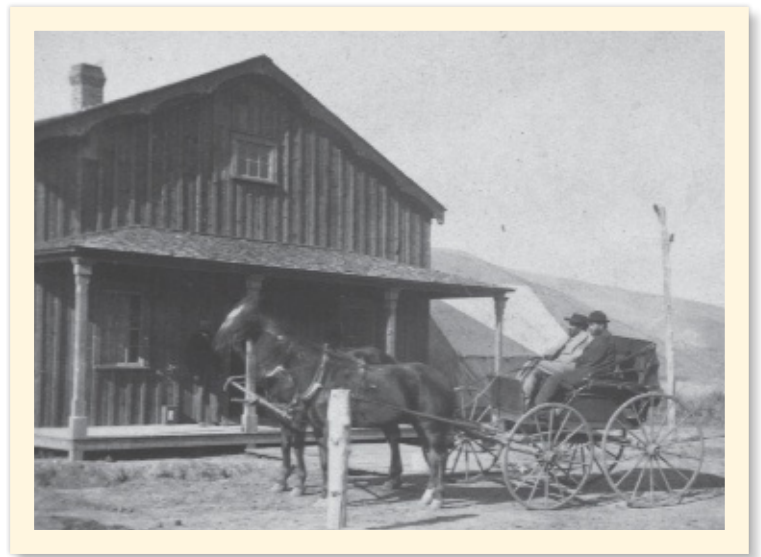
After the discovery of gold, many Americans made the risky decision to head west with hopes of making discoveries of their own. There were three ways to get from the eastern United States to California. Unfortunately, none were easy or safe.

The first involved going overland on foot, on horseback, or in wagons. Most overland travelers followed the Oregon-California Trails. The trail began in Independence, Missouri, before diverging in present-day Utah and ending in Oregon or California. The distance covered was usually more than 2,000 miles, sometimes much more.

Many of those miles were through harsh deserts and hazardous mountains. Weather, illness, and accidents killed many travelers on the trails. Often, travelers' biggest fears were attacks by Native Americans. Yet such attacks were rare. Depending on weather and luck, travelers could arrive in Oregon and California in five or six months.

The second way to head west involved a boat trip from the east coast of the United States, down around the southern tip of South America, and all the way back up to the coast of California. This method of travel was expensive, covered 18,000 miles of rough, dangerous seas, and still took about six months. The journey's success required great sailing skill on the part of a ship's crew.

The third way to reach California was to sail to the country of Panama, located on the narrow stretch of land between North and South America. Once docked, travelers crossed Panama by walking and canoeing through fifty miles of dangerous jungles. On the Pacific side of Panama, travelers boarded a second ship, which took them up to California. The biggest risk was catching disease—and many people did.

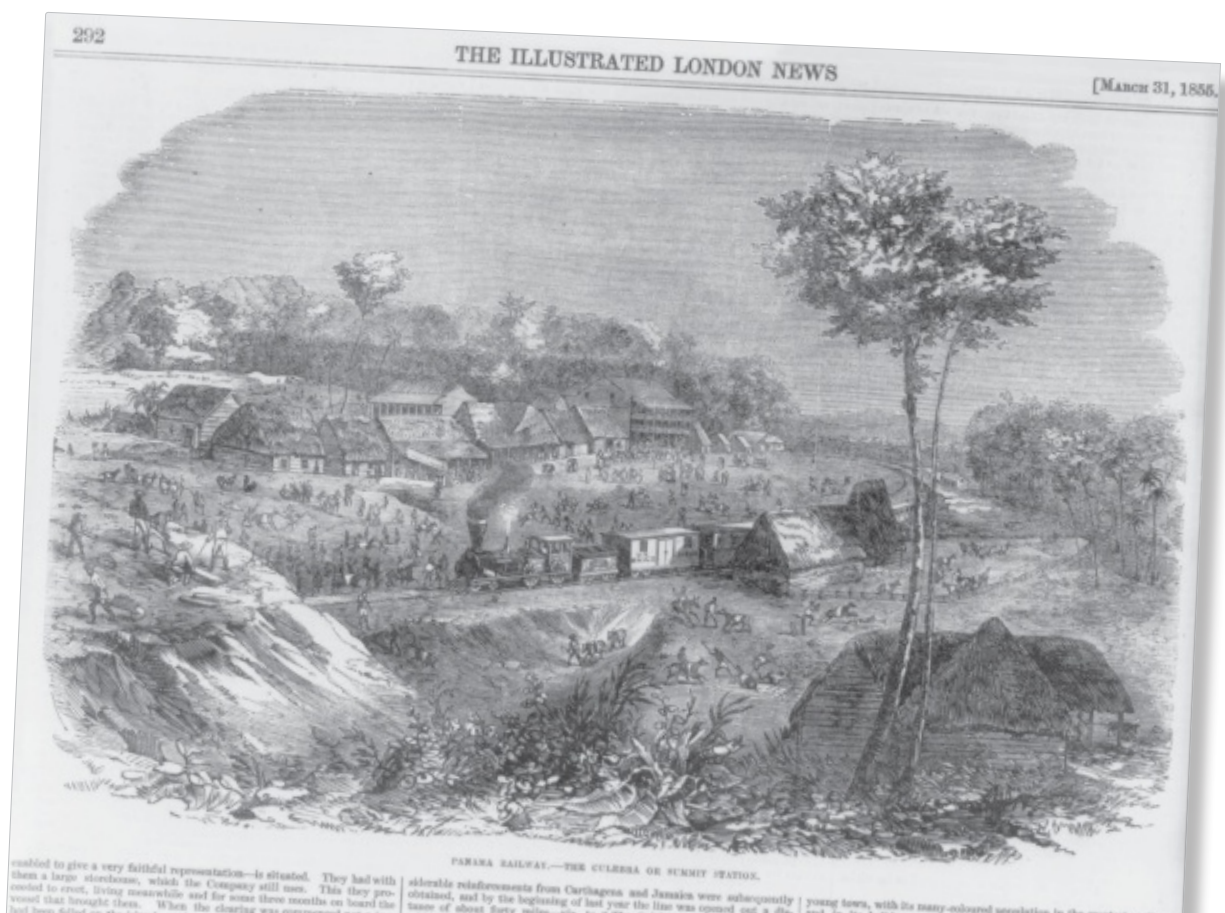


In 1855, Americans completed a railroad across Panama, which made the trip quicker but more expensive. It was especially costly to ship supplies from one U.S. coast to another. In addition, the train did not guarantee protection from jungle diseases.

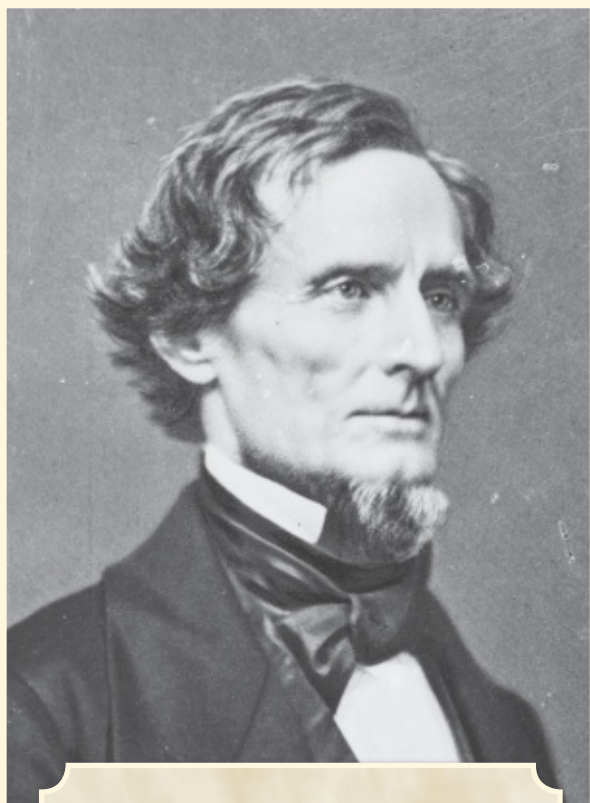
Today, travelers and traders can cut through Panama on the Panama Canal, completed in 1914, to speed up coast-to-coast travel for ships. Before the canal opened, however, Americans did not have that luxury.

In the early 1850s, as more railroads were built in the east, Americans started to ask a big question: why not build a railroad that reached across the United States to California? It would be difficult to build, but a railroad would make it easier to travel through western territories with rough terrain. It would also unite the eastern states with the new states in the west.

An illustration of the Panama Railway in the March 31, 1855 printing of *The Illustrated London News*



MAKING PLANS



JEFFERSON DAVIS

In 1853, the U.S. Congress decided to plan for the construction of a transcontinental railroad. Congress asked Jefferson Davis, the U.S. Secretary of War, to send out army surveyors to find routes that might be used for new rail lines.

The surveyors did their work and presented Davis and Congress with five possible routes. Each began at a different place along the Missouri River. One route ended in Seattle, the others in San Francisco or areas in southern California. Eventually, railroads would follow all five of these routes, but none of them was selected for the first transcontinental railroad.

One reason no route was chosen then was because people who lived in the northern states preferred a route that started in the north. People in the south wanted a southern route. There was a strong reason to choose one of the southern routes—it would be less expensive to build. However, many people feared that any southern route would lead to the spread of slavery in the western United States. Northerners would not risk that possibility.

Disagreement over which route to choose did not stop planning for the building of a transcontinental railroad. One American was especially active in planning and promoting the massive building project. His name was Abraham Lincoln. Historians have called Lincoln the “driving force” behind the building of a cross-country railroad.

THE RAILROAD LAWYER

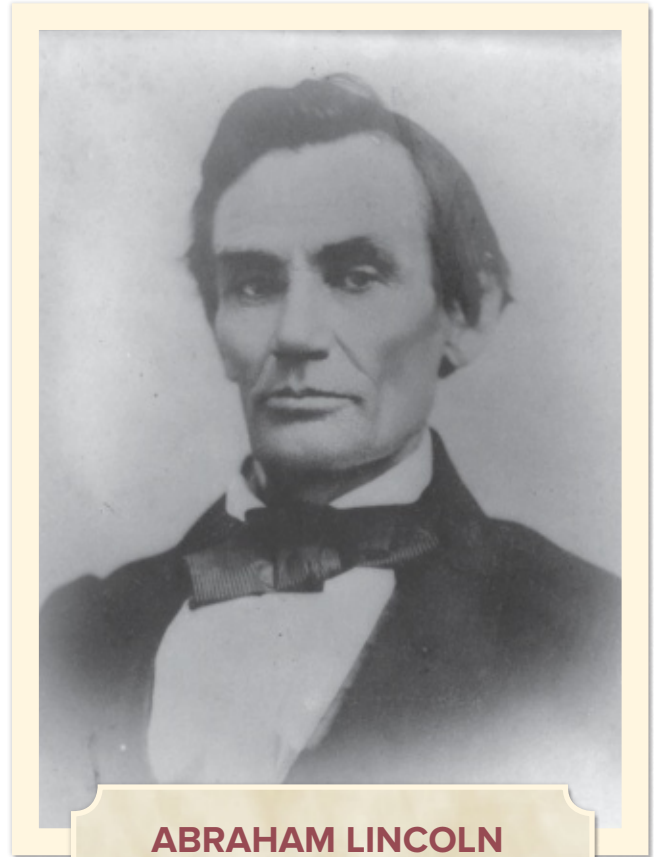
Long before he was elected president, Lincoln was a great believer in the future of railroads. As a lawyer in Illinois, he often represented railroad companies in court. When he campaigned for the presidency in 1860, Lincoln pledged he would build a transcontinental railroad.

Just weeks after President Lincoln was inaugurated, the Civil War started. Jefferson Davis was elected president of the Confederate states.

In spite of the demands of the war, Lincoln worked to ensure that a transcontinental railroad would be built. He met with railroad experts to get their ideas. He even identified experts whom he thought could build a rail line thousands of miles long.

Under Lincoln's leadership, the U.S. Congress passed the Pacific Railway Act on July 1, 1862. The act approved the building of a transcontinental railroad, named the companies that would build it, and explained how they would divide the work.

Because the southerners had left Congress when their states seceded, the remaining northerners decided that the railroad would follow a northern route. It would begin at Council Bluffs, Iowa—which was about as far west as railroad lines went at this point—and end in Sacramento, in northern California.



ABRAHAM LINCOLN

DETAILED PLANNING

Two companies were chosen to build the transcontinental railroad. The first was the Central Pacific, which would start building in California and head east. The second was the Union Pacific, which would start at Council Bluffs and head west.

The United States would pay for each mile of railroad track that the companies laid down. The rates the government paid for track built across mountains and deserts were higher than the rate for flat land. In addition, the government gave the companies wide plots of land next to the rail tracks they built. That land would eventually make both companies very rich.

The companies started work at opposite ends of the planned railroad route. Eventually, the tracks would meet somewhere in the middle, at an unnamed spot. That location would depend on how fast each company worked. Since each company was paid by the mile, they were in a race to see who could lay down the most track.

The success of each company depended on the abilities and determination of skilled engineers. These were not the kind of

engineers who drove locomotives.

These were engineers who surveyed the land where the rail lines would be built and drew detailed plans for each route.

Engineers studied vast lands to find the best routes. They had to decide exactly what needed to be done to lay tracks on those routes. In many cases, this meant planning where and how to cut tunnels through mountains or finding places to build bridges over wide, raging rivers. The engineers who planned the transcontinental railroad had to study in detail almost 2,000 miles of rugged country to find the safest, shortest, and most efficient route for the railroad.

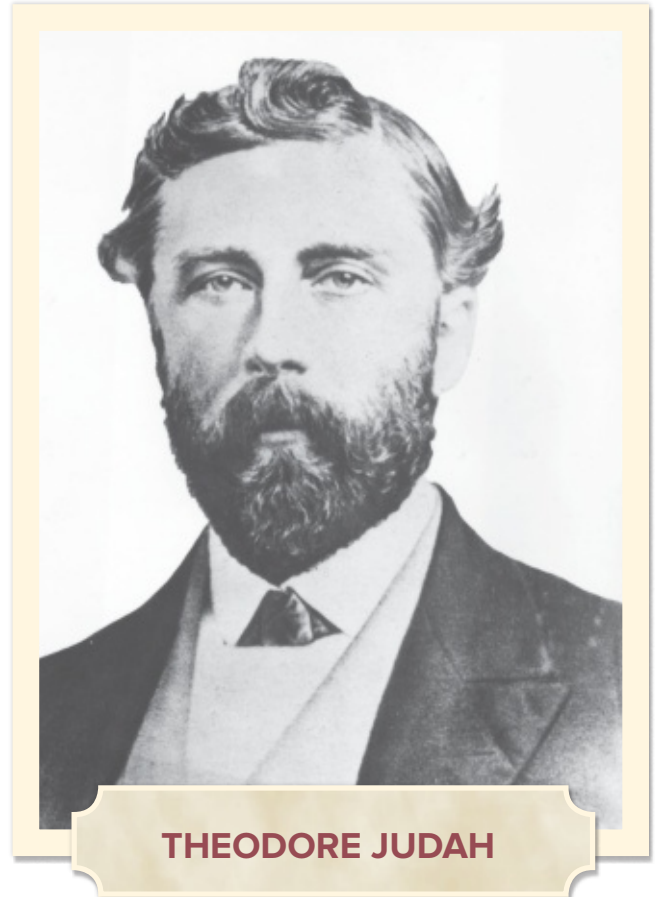


THE CENTRAL PACIFIC'S ENGINEERING WIZARD

Perhaps the most important transcontinental railroad engineer was Theodore Judah. In the 1850s, Judah successfully built the first railway in California. When the transcontinental railroad was just a dream for many people, he was busy planning it. He thought it should go through the rugged Sierra Nevadas in eastern California. On foot and on horse, Judah mapped and surveyed the mountain range himself. This meant risking his life in extremely dangerous conditions. The route Judah chose through the mountains was the route the transcontinental railroad eventually took.

With the encouragement of President Lincoln, Judah enlisted four Sacramento businessmen to help form the company that would build the western rail line. The company was the Central Pacific. Because of their involvement in the company, the four men eventually became some of the wealthiest people in America.

Judah did not live to see the transcontinental railroad built. During the first year of work on the western section of the railroad, Judah made an urgent business trip from California to New York. As he crossed Panama by train, he caught a disease called yellow fever and died in New York City.



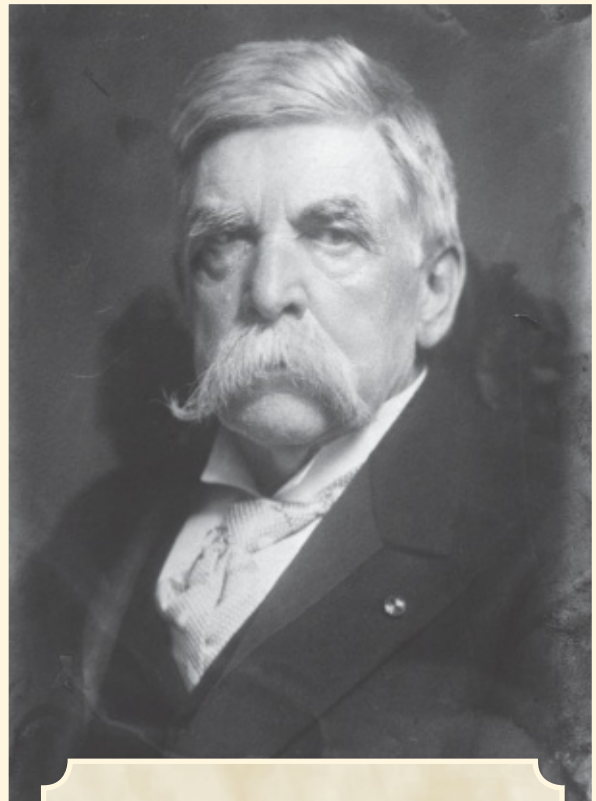
THEODORE JUDAH

THE UNION PACIFIC'S ENGINEERING WIZARD

The Union Pacific company knew the man it wanted as its chief engineer—Grenville Dodge. Like Judah, Dodge could carefully and expertly plan the route of the tracks that the Union Pacific would take from the east. A Civil War general, Dodge was also an experienced leader who could get the most out of his workers. Plus, as he did with Judah, President Lincoln had met with Dodge and recognized his talent and judgment. It was Dodge who convinced Lincoln that the starting point of the eastern section of the transcontinental railroad should be Council Bluffs.

There was one big problem: When the Union Pacific work began, Dodge was still a general in the Union Army. He led soldiers in the quick rebuilding of bridges and train tracks that were damaged or destroyed in the war. Dodge did not join the Union Pacific until after the Civil War ended.

Without good leadership and planning at the outset, the Union Pacific encountered major problems. While Central Pacific work crews cut massive tunnels through the mountains, the Union Pacific struggled to get any work done. It made little progress during the Civil War. After the war, the company finally hired Dodge as its chief engineer. It was only then that the Union Pacific Railroad Company found success.



GRENVILLE DODGE



An engineer looks at the progress of the Union Pacific Railroad.

THE WORK BEGINS

In early January 1863, the Civil War was raging in the eastern United States. But far from the war, in Sacramento, California, the Central Pacific held a groundbreaking ceremony. The building of the transcontinental railroad began.

Right away, the Central Pacific faced an unexpected challenge: they could not find enough laborers to build the railroad. Many potential workers were still searching for gold in California.

But there was a large group of men looking for work. In the 1850s, many Chinese immigrants had arrived in California. Like people all over the world, they were also part of the Gold Rush. And like most other people, most of these Chinese immigrants did not find very much gold—but some did find jobs. When work on the transcontinental railroad started, Chinese immigrants made up a small part of the labor force. Some American citizens, who did not wish to give the Chinese equal rights, were unhappy with this. Yet thanks to the skills and determination of the first Chinese workers, the Central Pacific hired many more Chinese immigrants. In spite of the risks, the immigrants were eager for work. Eventually, of the 10,000 workers laboring in the mountains, 8,000 were Chinese.

The Central Pacific did not treat Chinese workers as well as they treated white workers. Chinese workers got paid less, did the most difficult jobs, and they had to provide their own food. At one point, Chinese workers went on strike in an attempt to improve their pay and working conditions. The strike failed, however, and the Chinese workers were back to work in a week.

Like most workers, the Chinese immigrants faced long hours and great risks. Many of them lost their lives in explosions, falls, landslides, or train accidents.



Chinese laborer near the portal of Summit Tunnel

Many froze to death in the mountains in the wintertime or died in the desert heat in the summer.

Thousands of Chinese workers survived the hardships of building the rail line. Some took jobs building other rail lines in the west. Many saved their Central Pacific earnings and used the money to start businesses in California. Others used their savings to return to China.

By October 1863, the Central Pacific's first rails were completed in Sacramento and ready for trains. Huge locomotives were sent from the eastern United States by ship. The locomotives would haul passengers and also assist in building more railroad tracks.

By the spring of 1864, there was regular train service to a town about twenty miles from Sacramento. Yet for Central Pacific workers, the biggest challenge was still ahead: railway construction in the rugged Sierra Nevadas.



THE MOUNTAINS

In 1865, following Theodore Judah's plans, workers started to build wooden trestles so that trains could cross deep ravines in the mountains. Some of these bridge-like trestles stood more than 400 feet long and ninety feet high!

If building trestles was challenging work, digging tunnels through mountains was even harder. Workers first needed to build rail lines so that supplies and other workers could access the construction location. Supply trains could then slowly climb more than 5,000 feet into mountains, where the digging would start.

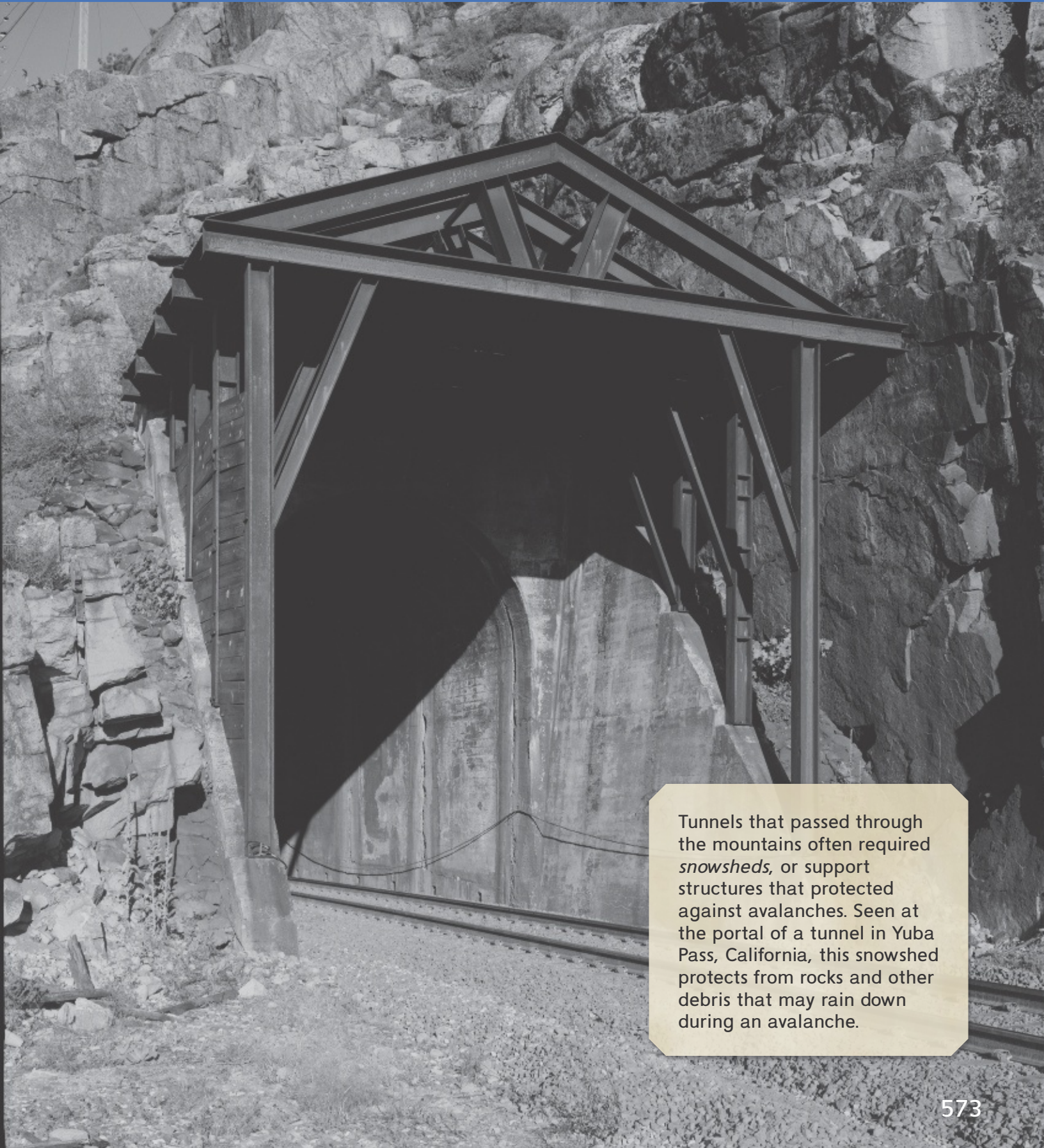
Once in the mountains, they needed to do two things. First, workers needed to cut wide, level paths along the mountainsides. This was where rails would be set and trains would travel. The second task was digging long tunnels through some parts of the mountains. It seemed almost impossible to do either task without risking workers' lives.

For Central Pacific workers, laboring in the mountains was extremely hazardous. Work had to be halted during the long winter snow season and in the mudslide season in the spring. Despite all these challenges, they made progress. By June 1868, passenger trains were running on the towering trestles and through the long tunnels of the Sierra Nevadas.

LIVES AT RISK

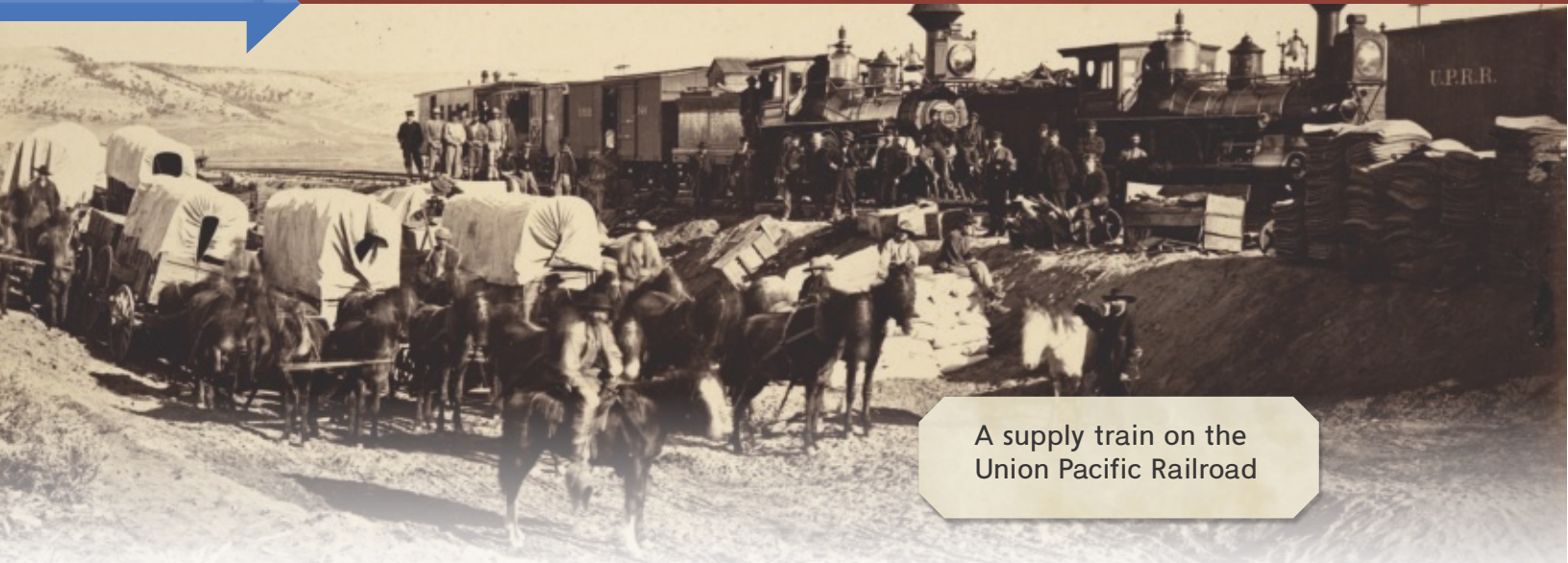
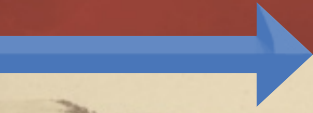
To build tunnels through the mountains, some Chinese workers were put at terrible risk. The workers wove wicker baskets large enough to hold one or two men. Workers standing higher up on the mountain lowered the baskets with men in them down the side of the mountain to where paths or tunnels were needed.

The workers planted explosive charges in the side of the mountain and lit them. Then the baskets were quickly pulled up so that the workers inside were safe when the dynamite exploded! Although lives were lost, the process was repeated until paths were level and openings for tunnels were completed.



Tunnels that passed through the mountains often required *snowsheds*, or support structures that protected against avalanches. Seen at the portal of a tunnel in Yuba Pass, California, this snowshed protects from rocks and other debris that may rain down during an avalanche.

THE RACE BEGINS



A supply train on the Union Pacific Railroad

On the other side of the country, the Union Pacific had gotten off to a slow start building its part of the transcontinental railroad. Its groundbreaking ceremony took place in December 1863, but the company did not lay its first rails until July 1865.

The Civil War directly interfered with the Union Pacific's sluggish pace, but poor leadership also delayed it. Things picked up quickly, however, after General Grenville Dodge was named the company's chief engineer in May 1866.

Dodge had an immediate problem. By law, the Union Pacific had to build one hundred miles of track before the end of June 1866. No one thought that it was possible, except Dodge. He hired two brothers, Jack and Daniel Casement, to help him. One of them was a former Civil War general, like himself. The two former generals made sure the deadline was not only met, but beaten.

Under Dodge, Union Pacific work crews included Civil War veterans, Irish immigrants, and African Americans recently freed from enslavement. When tracks were laid in Utah, thousands of Mormons also worked for the company.

Even with a late start, the Union Pacific had an advantage in the race to lay tracks. Its part of the transcontinental railroad would not traverse anything as challenging as the Sierra Nevadas. Not until August 1867 did Central Pacific crews finally finish blasting through the mountain range. At that point, Union Pacific crews had already reached Cheyenne, Wyoming, 500 miles from their starting point in Council Bluff, near the Missouri River.

THE UNION PACIFIC'S CHALLENGES

The going was not easy for the Union Pacific. Its route west went directly through Native American territories. Native Americans were angry that their lands were being divided by railroad tracks.

Not surprisingly, Union Pacific railroad surveyors and work crews suffered attacks by Native American warriors. Large numbers of both railroad workers and Native Americans were killed in ongoing battles. Native Americans also damaged tracks that had already been installed.

The U.S. Army established forts along the railroad line to protect rail workers. Yet fierce battles continued. Native Americans correctly understood that the transcontinental railroad would destroy much of their land and freedom.

Historians have pointed out that the Union Pacific had an advantage in the ongoing battles: the large number of Civil War veterans on their crews. These men had fought in battles in which thousands of soldiers had died. The small battles along the transcontinental railroad line were furious but did not frighten the veterans away. Dodge insisted that all workers be armed and fight back during attacks. This helped as well.

As work continued and trains started to run on the tracks, the battles grew fewer. Once again, Native Americans had to adapt to painful changes in their lands and lives.



MORE AND MORE MILES

As with Central Pacific rail construction, Union Pacific workers had to deal with bad weather. They could not work during the cold winter of 1868. Although the summers were extremely hot, and often fatal, workers labored through them.

In spite of all the challenges, construction continued at an ever more rapid pace. Temporary towns were built along the tracks. Workers stayed in these towns for short periods of time during construction. Because they were far from civilization, the temporary towns could be wild and dangerous places. Some people claimed that a worker's life was more at risk in these towns than while laboring on the railroad.


They made real progress and the new railroad went farther and farther west. As more track was finished, regular train service commenced in towns along the new line. The transcontinental railroad was already changing America.

Eventually, Union Pacific crews began carving through the Rocky Mountains in Wyoming. This was not quite as challenging for them as the Sierra Nevadas were for Central Pacific crews. The Union Pacific laid tracks at 8,200 feet in the Rockies, the highest elevation that either company reached.

Once the Union Pacific crossed the Rockies, the race between the two rail companies grew fierce. The money and rewards tied to miles were too big to allow either company to slow down. Quickly, both companies neared areas in Utah that could be natural meeting points for the two tracks. It seemed the building of the railroad was almost finished.



The monument at the site where the Union and Central Pacific Railroads were joined

A black and white historical photograph capturing the grand completion of the transcontinental railroad. A massive, diverse crowd of men, women, and children is gathered on a dusty, open plain. In the foreground, two men are kneeling on the ground, focused on driving a large iron spike into the wooden ties of a newly laid railroad track. The crowd, dressed in late 19th-century attire, surrounds them with interest and anticipation. The background shows a vast, flat landscape under a hazy sky, with some distant structures and utility poles visible. The overall atmosphere is one of a significant historical event.

But instead of choosing one point where the tracks would meet, the companies continued to build in the direction they were already heading. Soon, the tracks passed each other! Not only was this a waste of the government's money, but the closeness of the two crews also sparked battles between each company's workers.

Finally, the companies decided that the race should end, and the two rail lines would meet at Promontory Summit in Utah. The Union Pacific, coming from the east, covered the most miles, thanks to fewer geographical challenges.

On May 10, 1869, Union Pacific and Central Pacific officials and workers gathered with politicians, reporters, and visitors to watch and celebrate the as the final spike was pounded into the transcontinental railroad. The building of the railroad was done, and Americans could now travel from coast to coast by train, but increased travel across America was only just beginning.

You will answer the comprehension questions on these pages as a class.

Did You Know?

The golden spike was only gold-plated, as real gold was too soft to be used on the railroad. Today, this spike is on display at Stanford University in California.

Text Connections

1. Before the Transcontinental Railroad, how did people travel across the country?
2. Why was there a disagreement about where the route would start? Why did some people not want the route to travel through the South?
3. What number of Chinese immigrants worked on the railroad?
4. Think about “Thomas Jefferson Grows a Nation.” How did Lewis and Clark’s work lead to the Transcontinental Railroad?
5. Think of the ways people travel today. What does quick, convenient travel allow us to do?



Look Closer

Keys to Comprehension

1. In what year was gold discovered in California? In what year did California become a state? Quote from the text to support your answer.
2. How did immigrants play an important role in building the Transcontinental Railroad? Why did Chinese workers strike?

Writer's Craft

3. Review the following sentence from the selection: "When he campaigned for the presidency in 1860, Lincoln pledged he would build a transcontinental railroad." Based on the context, what do you think *pledged* means?

Concept Development

4. In "Thomas Jefferson Grows a Nation," you read about Lewis and Clark's expedition into the Louisiana Territory. How did the Transcontinental Railroad eventually make travel through that part of the country easier? Support your answer with details from the text.

Write

Write about how many different Americans, including African Americans, Chinese Americans, Irish Americans, and Civil War veterans, worked together to make possible the Transcontinental Railroad. What does this tell you about our country's legacy?



Read this Social Studies Connection. You will answer the questions as a class.

Text Feature

Diagrams are drawings that help show or explain information.

Staying on Track

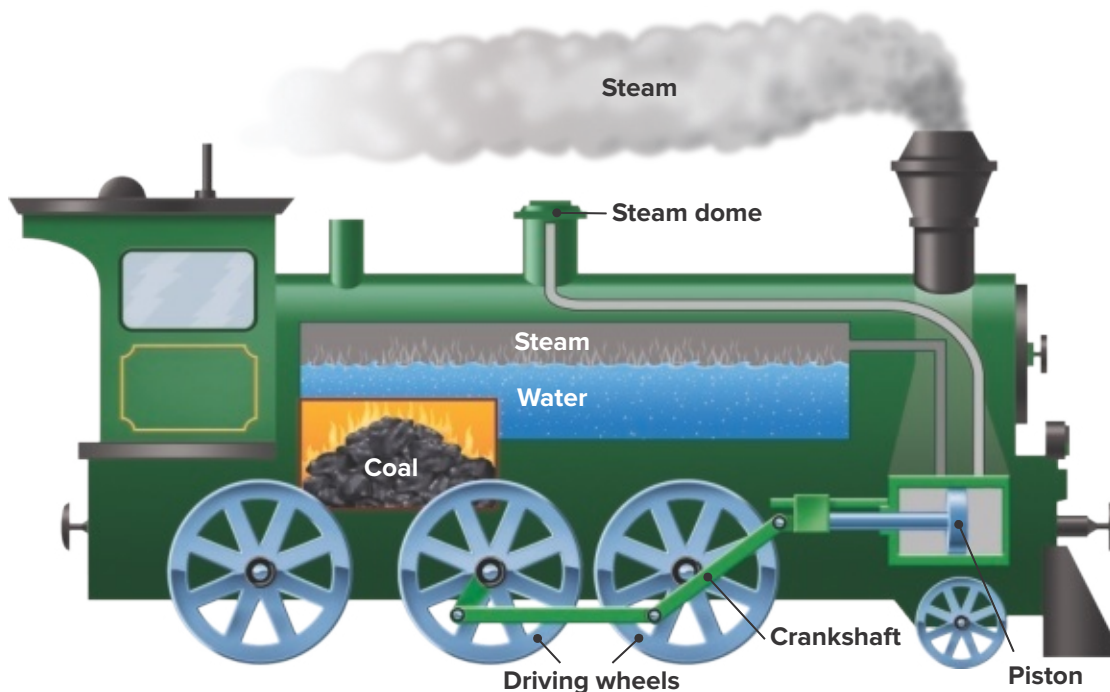
You just read about the Transcontinental Railroad, which began with the invention of the steam locomotive. Steam locomotives are driven by pressurized steam, which moves pistons to make the train's wheels move.

At the time of the Transcontinental Railroad, steam locomotives were an improvement. Traveling by train was faster than traveling on horseback or in covered wagons. The trek to the west coast that had once taken almost five months could now take between three and ten days, and was faster, safer, and cheaper than ever before.

But, of course, progress did not end there. People built passenger and freight locomotive lines in areas previously only connected by wagon or horse-drawn carriage. Hauling people and freight over long distances became dramatically easier.

Over the years, steam trains evolved. Eventually they transitioned to diesel and electric engines, which used new and cleaner kinds of power sources. Unlike steam engines, diesel and electric engines were efficient. With a steam engine, workers first had to start a coal fire to produce steam, and then had to wait until enough pressure built to move the locomotive. With electric and diesel engines, the locomotive could start moving almost instantly. These engines were smaller and safer than a traditional steam engine, too. If a steam engine had too much pressure, it could explode and cause a fatal accident.

Today people commonly use three types of modern locomotives: electric, diesel-electric, and diesel. Electric trains are the best for the environment because they produce zero emissions. As for steam locomotives, today they are mostly kept in museums, although some working models have been preserved as tourist attractions. As people continue to develop greener technologies, we will engineer new and cleaner ways to move into the future.



1. Compare the development of the steam locomotive to that of another modern technology. Is new technology always better than technology it replaces?
2. Compare and contrast benefits and drawbacks of steam, diesel, and electric engines.
3. What does the past show us about how new technologies can result in broader social change? How do advances help spread both information and culture?



Go Digital

Search for more information about transportation advances throughout history.