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Racing to the Future

China has rapidly become a world leader in high speed rail. Transportation times between many major Chinese cities have been cut: Journeys that took days now take hours. Here, we track the exciting technological developments in high speed rail and consider their cultural impact.

China Showcase Library Learn about China, through its history, people, places, and culture. Supported by original material developed by National Geographic Learning and People's Education Press, the China Showcase Library presents non-fiction reading selections on a variety of fascinating topics.

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Before You Read

The story begins in Shanghai, a major city located in the central section of China’s east coast, and then moves around 1,200 km to the north to Beijing, the nation’s capital. From there, the story takes us to Hebei, a **province**¹ which surrounds Beijing, and on to Shenyang, a city that is close to 700 km northeast of Beijing. The story picks up in Beijing again, heading northwest to Zhangjiakou and then west to Hohhot, Inner Mongolia. It continues further west to Baotou and then finally southwest to Lanzhou in the far west of China. Other cities mentioned are Changsha, in south central China; Hefei, a city approximately 470 km west of Shanghai; and Fuzhou, a city located on the east coast of China, across from Taiwan and roughly midway between Shanghai and Shenzhen.

A. China Before Rail. Read the paragraph. Then complete the sentences with the correct forms of the underlined words.

Before rail was introduced, the primary means of transportation in China was by boat, often along China’s many great rivers, which include the Yellow River in the north, the Changjiang (known as the Yangtze River in English) in central China, and the Zhujiang in the south. People also used the Grand Canal, one of the glories of ancient China, which connected Beijing with Hangzhou, about 1,300 kilometers to the south. Traveling long distance by road had many drawbacks, as there were mountains and rivers to cross, and the roads were sometimes poor. The sheer difficulty made it unpopular, but when people did travel long distance by land they often walked, or rode donkeys or horses. Carriages were not very common, though rich people sometimes used them. Transporting goods over land was most often accomplished by donkey or camel.

- 1. We were impressed by the new railways station. It is such a _____ and beautiful building that it outshined all the buildings around it.
- 2. The train was so fast that we _____ our trip in less than four hours.
- 3. While we would like to travel there by car, it has too many _____. The train is just easier.
- 4. I’d like to travel in a _____ pulled by two white horses when I get married.
- 5. The trip through south China was simply _____—we saw so many wonderful things!
- 6. It was _____ joy to see the beautiful mountains from our train as it rushed through the countryside.

¹ **province**: a large district of a country

B. High Speed Rail in China. Look at the table and look at the photos in this reader. Then answer the questions below.

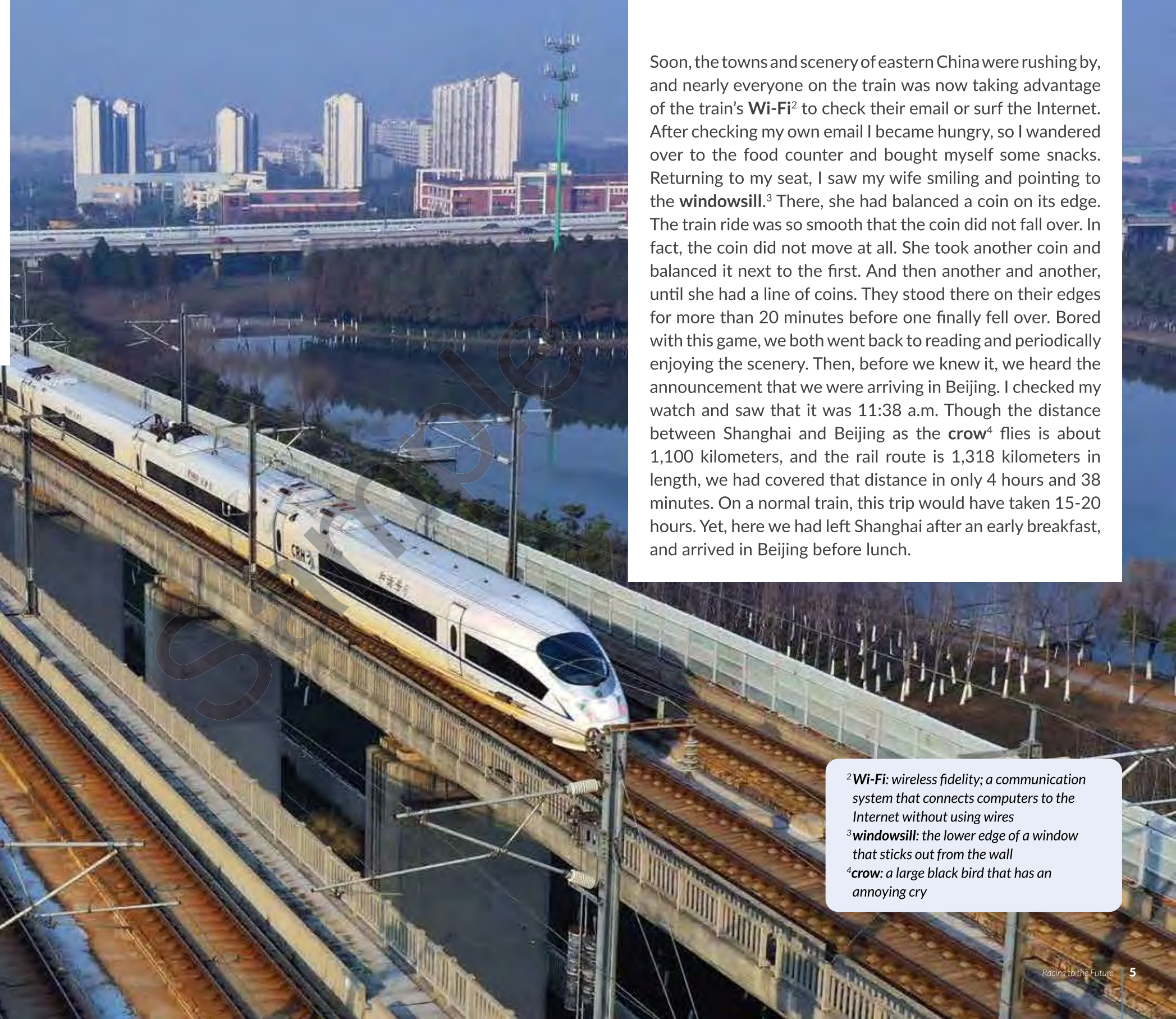
The Growth of High Speed Rail (HSR) in China					
Year	2009	2011	2013	2015	2017
HSR track (km)	2,699	6,601	11,028	19,838	25,164
HSR / total track (%)	3.2%	7.1%	10.7%	16.4%	19.8%
HSR passengers (millions)	46.5	285.5	529.6	961.4	1,752.2
HSR / total rail passengers (%)	3.1%	15.8%	25.1%	37.9%	56.8%

- 1. Have you ever ridden on a high speed train? What was it like?
- 2. What do you know about high speed trains in China?
- 3. Why do you think people might prefer riding high speed trains over other forms of transportation, such as plane or car?
- 4. What other countries have high speed rail? How might their high speed rail systems differ from that in China?



At 7 a.m., we boarded the state-of-the-art Fuxing Hao train at Shanghai Railway Station. We stored our bags at the front of the car, found our seats, and settled in. After some announcements in Chinese and English, the train slowly set off. I say “slowly” because that is exactly how it felt. Unlike other trains which start with a shake, this train accelerated so smoothly that if you were not looking out the windows, you could hardly tell we were moving. Yet, within minutes, we were passing over the rails at speeds of more than 350 kilometers an hour.

Track 1



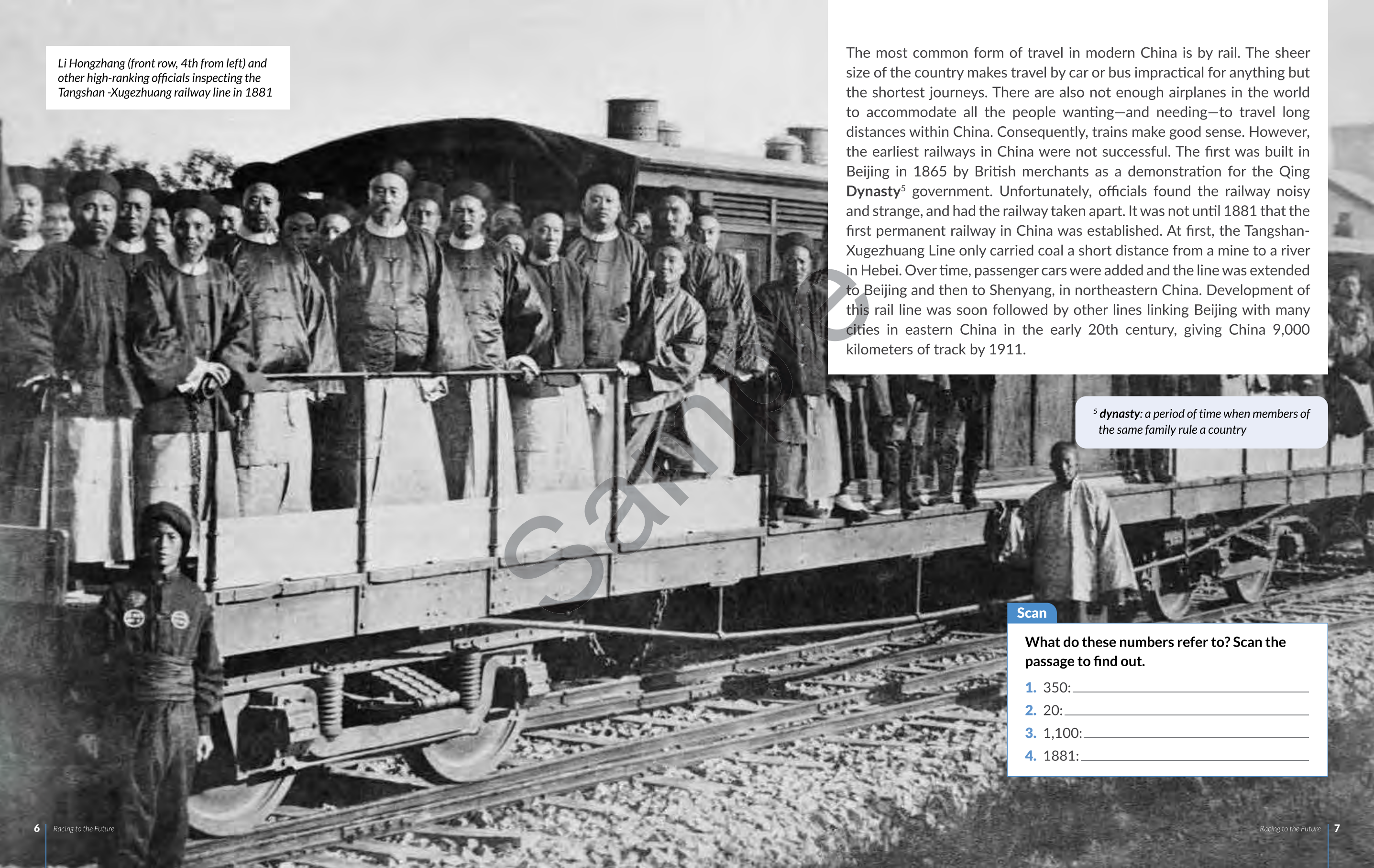
Soon, the towns and scenery of eastern China were rushing by, and nearly everyone on the train was now taking advantage of the train's **Wi-Fi**² to check their email or surf the Internet. After checking my own email I became hungry, so I wandered over to the food counter and bought myself some snacks. Returning to my seat, I saw my wife smiling and pointing to the **window sill**.³ There, she had balanced a coin on its edge. The train ride was so smooth that the coin did not fall over. In fact, the coin did not move at all. She took another coin and balanced it next to the first. And then another and another, until she had a line of coins. They stood there on their edges for more than 20 minutes before one finally fell over. Bored with this game, we both went back to reading and periodically enjoying the scenery. Then, before we knew it, we heard the announcement that we were arriving in Beijing. I checked my watch and saw that it was 11:38 a.m. Though the distance between Shanghai and Beijing as the **crow**⁴ flies is about 1,100 kilometers, and the rail route is 1,318 kilometers in length, we had covered that distance in only 4 hours and 38 minutes. On a normal train, this trip would have taken 15-20 hours. Yet, here we had left Shanghai after an early breakfast, and arrived in Beijing before lunch.

²**Wi-Fi**: wireless fidelity; a communication system that connects computers to the Internet without using wires

³**window sill**: the lower edge of a window that sticks out from the wall

⁴**crow**: a large black bird that has an annoying cry

Li Hongzhang (front row, 4th from left) and other high-ranking officials inspecting the Tangshan-Xugezhuang railway line in 1881



The most common form of travel in modern China is by rail. The sheer size of the country makes travel by car or bus impractical for anything but the shortest journeys. There are also not enough airplanes in the world to accommodate all the people wanting—and needing—to travel long distances within China. Consequently, trains make good sense. However, the earliest railways in China were not successful. The first was built in Beijing in 1865 by British merchants as a demonstration for the Qing **Dynasty**⁵ government. Unfortunately, officials found the railway noisy and strange, and had the railway taken apart. It was not until 1881 that the first permanent railway in China was established. At first, the Tangshan-Xugezhuang Line only carried coal a short distance from a mine to a river in Hebei. Over time, passenger cars were added and the line was extended to Beijing and then to Shenyang, in northeastern China. Development of this rail line was soon followed by other lines linking Beijing with many cities in eastern China in the early 20th century, giving China 9,000 kilometers of track by 1911.

⁵ **dynasty**: a period of time when members of the same family rule a country

Scan

What do these numbers refer to? Scan the passage to find out.

1. 350: _____
2. 20: _____
3. 1,100: _____
4. 1881: _____

Zhan Tianyou (front row, 8th from left) at the opening ceremony of Beijing-Zhangjiakou railway line on November 2, 1909



One important early rail line was the Beijing-Zhangjiakou line, completed in 1909, which connected Beijing with the city of Zhangjiakou, about 200 kilometers to the northwest. Other rail lines then under development used Western financing and assistance, but Zhangjiakou was an important trading post with Russia and the Chinese government felt the line was a high priority, so it decided that construction should be all-Chinese, and headed up by a Chinese engineer. Hence, Zhan Tianyou (1861-1919) was given this important job. Zhan had been born in Guangdong, but when he was twelve years old, he was sent by the government to study in the USA, where he graduated from high school and then attended Yale University to study engineering. He received a **Ph.B.**⁶ in 1881. On his return to China, he gained experience working on the railroad between Beijing and Shenyang, before being given the responsibility of building the Beijing-Zhangjiakou line. Through his skill, many technical difficulties were overcome and the railroad was completed two years ahead of schedule, earning Zhan the nickname the Father of Chinese Railroads, which was used inside and outside China.

As the 20th century progressed, new lines were built, and existing rail lines were lengthened. For example, the Beijing-Zhangjiakou line was extended 300 kilometers to Hohhot, Inner Mongolia by 1921, and then another 186 kilometers to Baotou by 1923. Development of the Chinese rail network, however, was soon stalled by war.

⁶**Ph.B.:** an advanced university degree

A. Multiple Choice. Answer the questions below by choosing **A**, **B**, **C**, or **D**.

1. What does the phrase “as the crow flies” mean on page 5?
 - A. by plane
 - B. going the quickest way
 - C. in a straight line
 - D. using the highway
2. What would be a good heading for the paragraph on page 7?
 - A. China’s First Steps Towards Rail Travel
 - B. The Story of the Tangshan-Xugezhuang Line
 - C. Trains, a Noisy and Strange Invention
 - D. China is a Big Country
3. According to the passage, what repays the effort of building the Hefei-Fuzhou line?
 - A. the popularity of the line as a tourist attraction
 - B. the spectacular views
 - C. being able to travel quickly between the two cities
 - D. the technical challenges
4. According to the passage, what is the most difficult high speed rail venture that China plans to take on?
 - A. connecting the whole country with high speed rail
 - B. building maglev trains
 - C. designing and building its own trains
 - D. a rail network connecting China with Europe
5. On page 18, the passage says, “No doubt, it will also bring the people of the country closer together.” What does “it” refer to?
 - A. the reduced travel time
 - B. accelerated development within China
 - C. the convenience of high speed rail
 - D. the affordable cost of high speed rail

B. Put Events in Order. Put the events below in the order that they happened. Number them 1-8.

- _____ The Chinese Ministry of Railways began joint ventures to develop high speed rail within China.
- _____ The Tangshan-Xugezhuang Line was established.
- _____ The Hefei-Fuzhou high speed rail line was completed.
- _____ The Shanghai Maglev was opened to the public.
- _____ The Beijing-Zhangjiakou line was completed.
- _____ A railway was built by British merchants as a demonstration.
- _____ The Baotou-Lanzhou Line was completed.
- _____ The Fuxing Hao rolled into production.

C. Answer the questions. Use information from the passage to answer the questions below.

1. Apart from the speed, what impressed the author most about high speed train travel?
2. What are some reasons why Chinese prefer rail travel over other forms of transportation?
3. What does the failure of China’s first train say about Qing Dynasty officials?
4. How do you prefer to travel? Why?

Railways on the Roof of the World



Track 2

By far, the most technologically challenging railway ever built was probably the Qinghai-Tibet Railway, completed in 2006, connecting Xining to Lhasa, 1,956 kilometers away. Fully 550 kilometers of this line are built on permafrost—frozen earth. The rail line is also by far the highest in the world: at Tanggula Pass it is 5,072 meters above sea level, and more than 960 kilometers of the line is above 4,000 meters. The railway was first planned in the 1950s, but the technical difficulties were too much to overcome. It was not until 1984 that the first 814-kilometer section of the railway, from Xining to Golmud, was completed, and the rest of the railway had to wait for the development of new technology. The biggest issue was the permafrost. In the summer, in many places the top layer of the permafrost melts and turns to mud, making the ground unstable. A variety of solutions were used to get around this. In some cases, railway bridges were built. The longest bridge—a world record in fact—is over 11.7 kilometers in length. Railway bridges not

only keep the train line off the permafrost, but they also allow animals to pass under the tracks. In other cases, pipes were installed under the ground to keep it frozen during the summer. Finally, in some areas it was impossible to build the railway over the permafrost, so engineers tunneled through it.

It is hoped that many of the lessons learned from building the Qinghai-Tibet Railway can be used in a new project, linking Kashi (Kashgar), China with Islamabad, Pakistan along the Karakoram Highway, the highest highway in the world. This railway will travel 1,000 kilometers through the Pamir Mountains, which are nicknamed the Roof of the World because of their high elevation. While permafrost is not a factor on the Karakoram Highway, the road often gets damaged by winter landslides and large sections have to be rebuilt each spring. Building a railway along such a route will be a technical challenge indeed. It has not yet been announced when construction on this project will start.

 **Word Count:** 349
Time: _____