

B+ / BLB+ LEVEL

PART 1 (Estimated CEFR-J Level: B2.5)

In the movie *Interstellar*, Earth is slowly becoming unlivable, so people have to search for new planets where humans can survive. This idea from *Interstellar* is not only science fiction. Today, scientists are already preparing for missions that go far beyond Earth. They are planning to have long trips in space and even build future cities on other planets. For this reason, the main priority of modern science and engineering is to find safe and sustainable ways to produce power in space because producing energy in outer space is a serious challenge.

Currently, the most common way to generate energy is by using sunlight. Solar panels are very effective near Earth because they can capture about 1,360 watts of power per square meter. Solar panels in space are much more efficient than the ones we use in our homes. While home panels usually have an efficiency of around 20%, space-certified panels often reach 30% or even 40% efficiency because they use special materials like gallium arsenide.

As we travel further away from the Sun, the amount of available light decreases very quickly. On Mars, the amount of sunlight received is under 40% of what Earth receives, at around 550 watts per square meter. When we reach Jupiter, sunlight is only 4% of what we receive on Earth, which makes it very difficult to use solar power for deep-space missions. In these dark areas of space, scientists use nuclear power sources called Radioisotope Thermoelectric Generators, or RTGs. These systems are incredibly reliable; for instance, the Voyager probes have been using this technology for over 45 years.

NASA has been developing a project called Kilopower. The project focuses on building small nuclear reactors. These reactors are designed to produce between 1 and 10 kilowatts of electricity for at least 15 years. This energy would be used not only for basic survival needs like light and heat but also to get oxygen from the Martian atmosphere and to create fuel for the return journey. These reactors are very useful because they are small and can operate during the long nights on the Moon, which last for about 14 Earth days.

Another interesting possibility for the future is wind energy on Mars. Although the Martian atmosphere is very thin—about 1% of the density of Earth's atmosphere—the winds can still be strong enough to turn a wind turbine. Scientists have calculated that a medium-sized turbine that produces 330 kilowatts on Earth would only produce about 10 kilowatts on Mars. While this is a big reduction, wind power could be very useful during global dust storms. During these storms, dust blocks sunlight and makes solar panels useless, but wind speeds increase.

PART 2 (Estimated CEFR-J Level: B2.2)

The California Gold Rush began in January 1848. A man named James Marshall was working at a sawmill for a wealthy landowner named John Sutter. One morning, Marshall noticed shiny yellow pieces in the river water. After testing them, he realized they were gold. At first, Marshall and Sutter tried to keep the discovery secret because they were worried that workers would leave their jobs and take over Sutter's land.

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However, the secret was impossible to keep. Workers began to talk, and soon newspapers reported the news.

Thousands of people rushed to California, hoping to become rich quickly. These people were called the "forty-niners," named after the year they arrived. They believed gold was easy to find and that anyone could become rich.

Traveling to California was a long and dangerous journey. Some people traveled across North America in covered wagons. This journey could take four to six months. Travelers faced cold winters, wild animals and deadly diseases like cholera. Others traveled by ship around Cape Horn, the southern tip of South America. This trip could take six months or more, and ships often faced strong storms and rough seas. The third route was through Panama. Travelers sailed to Central America and then took another ship to San Francisco. Many people became sick or died from tropical diseases or from the heat that was too intense.

When the miners arrived, life in the mining camps was very difficult. There was little clean water, and diseases spread quickly. Food and supplies were extremely expensive. A single egg could cost \$1, and a pair of boots could cost \$100. Therefore, selling food, necessary tools, and vital services to miners was more profitable for many people than actually mining for gold.

The Gold Rush changed California forever. Before 1848, California had a small population. After the Gold Rush began, people came from many parts of the world and made California one of the most culturally diverse places in the country.

The Gold Rush also had serious environmental effects. Rivers were polluted, forests were cut down, and land was destroyed by mining.

By the mid-1850s, most of the easy gold was gone and many forty-niners left California. Others stayed and started farms, shops, railroads, and businesses, helping the state grow economically. Because of the rapid population growth, California officially became the 31st state of the United States in 1850.

PART 3 – NOTE TAKING (Estimated CEFR-J Level: B2.1)

Good morning, everyone. Today, we are going to explore the life of one of the most famous businessmen in history. You probably recognize his face from the red and white logos in almost every city in the world. Any guesses? Well, he's the founder of Kentucky Fried Chicken, KFC.

Okay, students. Let's start. Let's begin by looking at where his journey started.

Harland Sanders was born in 1890 on a small farm in Indiana. When he was only six years old, his father died, and his mother had to work very hard to support the family. Because his mother was away at work, Harland had to stay home and look after his younger brother and sister. This was when he began cooking for his family. By the age of seven, he was already a good cook, and this early experience helped him develop the skills he would use many years later.

When he was twelve, his mother married another man. Harland did not get along with his stepfather and often argued with him over chores and rules. One day, after a heated fight about how to clean the kitchen

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properly, Harland packed his things and left home. He was only thirteen years old at the time. This began a long period of his life during which he moved from town to town and worked in many different types of jobs. He worked as a farmer, a railroad worker, and even as a lawyer. Everything changed when he moved to Kentucky.

In 1930, during a time called the Great Depression, Sanders began running a service station in Corbin, Kentucky. A service station was a place where people stopped to get fuel for their cars. He noticed that travelers were often hungry, so he decided to cook for them. His food was so delicious that more and more people started coming just for the meals, not for the fuel. This was the beginning of his real success in the food industry.

Sanders knew that his fried chicken was good, but he wanted to make it perfect. He created a special mix of eleven herbs and spices. Although he found the perfect taste for his fried chicken, he had a huge problem. The problem was the long cooking time of the chicken. In those days, frying the chicken in a pan took thirty minutes, which was too long for hungry travelers. To solve this, he began using a pressure cooker. The result was meat that was very juicy and tender on the inside but crispy on the outside.

Everything seemed to be perfect for several years. However, life became difficult again in the early 1950s. For many years, Sanders' restaurant in Corbin, Kentucky, was successful because it was located on a busy road called U.S. Route 25. However, the government decided to build a new, larger highway called Interstate 75 (I-75). Because these new roads were designed to go around towns rather than through them, travelers no longer had to drive past the Sanders Café. Almost overnight, the customers disappeared. By 1956, the Colonel realized that his restaurant would no longer be profitable. He had to sell his building and all of his kitchen equipment. After paying his debts, he was left with only \$105 a month from his Social Security check.

He believed so strongly in the quality of his chicken that he decided to start a franchise business. To sell his franchise, he traveled across the United States in his old car, carrying his pressure cooker and his flour mixture. He would visit different restaurants, cook his chicken for the owners, and hope they liked it. Eventually, his hard work paid off. The first official KFC franchise opened in Utah in 1952, and soon, the brand began to spread quickly across the country.

By 1964, there were over 600 KFC locations. Colonel Sanders passed away in 1980 at the age of 90. By that time, KFC had become a global brand with thousands of restaurants in many different countries. Today, you can find the Colonel's face on every KFC bucket, and his story continues to inspire people.