

Chip Connections

Trace how one Texas invention links people and places.

7.19.E “analyze how scientific discoveries and technological innovations have resulted in an interdependence among Texas, the United States, and the world.”

NAME _____ DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline words or phrases that show Texas, the United States, or other countries relying on one another. Write T, U, or W in the margin beside each place involved.

From Dallas to Devices

- ① In 1958, engineer Jack Kilby built a working integrated circuit at Texas Instruments in Dallas. His invention placed several electronic parts on one small piece of semiconductor material. It built on scientific knowledge that materials such as silicon can control the flow of electricity. Integrated circuits made computers smaller and more reliable. Today, chips based on this idea operate phones, medical devices, vehicles, and factory machines. A discovery about materials and a Texas innovation helped create technology used far beyond the state.
- ② Making a modern chip now requires work in many places. Texas engineers may design or test chips, while companies in other U.S. states and countries supply specialized equipment, software, chemicals, wafers, and packaging. Some chips are manufactured overseas, then shipped to Texas companies that place them in products. Texas businesses depend on these partners to obtain parts and maintain jobs. In turn, customers across the United States and the world depend on Texas workers and companies for chip design, testing, and products.
- ③ This network can be affected by events far from Texas. During the COVID-19 pandemic, chip shortages slowed production of some cars and electronics in the United States, including at Texas businesses. A factory shutdown, shipping delay, or shortage of a chemical can interrupt the chain. Scientists continue studying new materials, and engineers develop smaller, more efficient chips. As new technology spreads, Texas, the United States, and other nations must share knowledge, trade materials and parts, and respond to problems that affect everyone.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What scientific idea helped make integrated circuits possible, and what change did integrated circuits make?

2 What are two kinds of supplies that Texas chip businesses may receive from other U.S. states or countries?

3 How does the chip network show two-way interdependence among Texas, the United States, and the world?

4 Explain how a shipping delay or factory shutdown far from Texas could affect a Texas business.

3 YOUR TURN _____ Your own words

Choose a technology you use or know. In three sentences, explain a scientific discovery or innovation behind it, show how Texas, the United States, and another country or region could rely on one another, and describe one possible disruption effect.

PART 1 • READ AND MARK

Underline words or phrases that show Texas, the United States, or other countries relying on one another. Write T, U, or W in the margin beside each place involved. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What scientific idea helped make integrated circuits possible, and what change did integrated circuits make?	Scientists knew that semiconductor materials such as silicon can control electricity. Integrated circuits put several parts on one small piece of material, making computers smaller and more reliable.
2	What are two kinds of supplies that Texas chip businesses may receive from other U.S. states or countries?	Accept any two: specialized equipment, software, chemicals, wafers, or packaging.
3	How does the chip network show two-way interdependence among Texas, the United States, and the world?	Texas businesses rely on supplies and some manufactured chips from other states and countries. In return, customers in the United States and around the world rely on Texas workers and companies for chip design, testing, and products.
4	Explain how a shipping delay or factory shutdown far from Texas could affect a Texas business.	It could interrupt the supply chain, so the Texas business might not receive needed chips, chemicals, or other parts. Production and jobs could be affected.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Solar panels use semiconductor materials to turn sunlight into electricity. A Texas company could install panels designed in the United States and made with parts from South Korea. If shipping stops, Texas projects may wait for parts, while workers and customers in several places lose business.

Accept other accurate technologies and reasonable examples of exchange among Texas, the United States, and another nation or region. The response must include a science or technology connection, mutual reliance, and a plausible effect of a disruption.