Why Here, Not There?

Use geologic evidence to explain where resources are found.

MS-ESS3-1 "Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB As you read, underline evidence about the processes that placed each resource, circle evidence about where it is found, and number each way people can reduce its supply.

Three Places, Three Resources

1. Along some coastlines, drills reach oil deep below the ground, while nearby places have none. Long ago, tiny sea organisms died and settled in muddy seafloor layers. More sediment buried them, and heat and pressure slowly changed their remains into oil. The oil moved through rock until a layer it could not pass trapped it. Places without the right buried layers and trap did not collect much oil. People can pump a trapped supply in decades, but the steps that formed it took millions of years.

2. High in another region, miners dig rock that contains copper. Millions of years ago, one plate of Earth's crust slid beneath another. Hot fluids linked to this plate movement flowed through cracks and carried dissolved metals. As the fluids cooled, copper minerals collected in some cracks, forming ore deposits. Other areas lacked these conditions, so their rocks hold far less copper. Mining removes the richest ore first. The copper does not grow back, and finding more nearby may mean digging deeper into rock with less metal.

3. A town near a river draws groundwater from an aquifer, a layer of sand and gravel that holds water in spaces between grains. The river deposited those loose layers over time. A nearby ridge of solid, unbroken rock has far fewer spaces for water, so wells there may produce less. Rain can refill the aquifer, but only as water slowly soaks down. If the town pumps faster than water returns, the water level falls, and shallow wells may run dry. Even a resource that can refill has limits.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why might one coastal area have an oil deposit while a nearby area does not? Use two pieces of evidence from the passage.

2. Explain how past plate movement caused copper ore to be concentrated in some rocks but not others.

3. Why might wells near the river produce more groundwater than wells on the nearby ridge?

4. How can human removal reduce both a copper deposit and an aquifer, even though only one can refill?

3 YOUR TURN

Your own words

A new town needs a well. It can drill beside an old riverbed filled with sand and gravel or on a ridge of solid, unbroken rock. In four sentences, recommend a site, explain the geoscience process behind your choice using two details from the passage, and describe how the town could keep its water supply from falling.

Why Here, Not There?

PART 1 · READ AND MARK

As you read, underline evidence about the processes that placed each resource, circle evidence about where it is found, and number each way people can reduce its supply. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why might one coastal area have an oil deposit while a nearby area does not? Use two pieces of evidence from the passage.	**Oil formed where buried sea organisms changed under heat and pressure, then collected beneath a layer it could not pass. A nearby area without the right buried layers and trap would not collect much oil.**
2	Explain how past plate movement caused copper ore to be concentrated in some rocks but not others.	**Where one plate slid beneath another, hot fluids carried metals through cracks. Copper minerals collected as the fluids cooled, while areas without those conditions had far less copper.**
3	Why might wells near the river produce more groundwater than wells on the nearby ridge?	**The river deposited sand and gravel with spaces that hold water. The ridge's solid, unbroken rock has far fewer spaces for water.**
4	How can human removal reduce both a copper deposit and an aquifer, even though only one can refill?	**Mining removes copper ore, which does not grow back. Pumping an aquifer faster than rain refills it lowers the water level and can dry out shallow wells.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The town should drill beside the old riverbed. Rivers deposit sand and gravel, which have spaces that can hold groundwater. Solid, unbroken rock on the ridge has far fewer spaces for water. The town should avoid pumping faster than rain can refill the aquifer, or its water level could fall.

Accept explanations that connect each resource's location to the stated geoscience process and distinguish slow or absent replacement from human removal. For Your Turn, accept any four-sentence response that recommends the riverbed using two relevant passage details and explains how pumping affects the supply.