Where Resources Gather

Use field evidence to explain uneven resource deposits

6.5.d "Use research-based evidence to propose a scientific explanation of how the distribution of Earth's resources, including minerals, fossil fuels, and groundwater, results from ongoing geoscience processes."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline one observation about where each resource is found. Circle a process that explains each observation, then number each matching pair 1, 2, and 3.

Clues Beneath a Valley

1. Imagine a field team exploring a mountain ridge and the wide valley beside it. On the ridge, they find copper-rich rock in cracks near an ancient volcano. Tests show that the copper formed when hot water carrying dissolved minerals moved through the cracks. As the water cooled, copper minerals settled out. Rain, streams, and shifting rock continue to expose some of these buried deposits. But the team finds little copper in the loose sand of the valley floor. Their rock samples provide clues about this uneven pattern.

2. Deep beneath one side of the valley, drill cores reveal dark coal layers between layers of sedimentary rock. The coal began as plants in an ancient swamp. After the plants died, waterlogged ground slowed their decay. Sediment buried the plant remains, and heat and pressure changed them into coal over millions of years. Cores from the other side contain no coal, but they do contain thick layers of rock made from sand. The swamp did not cover every part of the region.

3. The team's wells show that groundwater collects in tiny spaces between grains of sandstone beneath the sandy side of the valley. Rain soaks into the ground where this rock reaches the surface, then moves slowly through its connected spaces. A layer of clay-rich rock below slows the water's downward movement. Wells drilled into solid, uncracked rock on the ridge yield much less water. The team also measures water levels after storms and during dry months. These changes show that groundwater is renewed by rain, though pumping can lower its level.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why is copper more likely on the ridge than in the valley sand? Use a field observation and a process from the passage.

2. Why do drill cores show coal on only one side of the valley? Connect the core evidence to how coal forms.

3. Why do wells in sandstone yield more groundwater than wells in the ridge rock? Use rock evidence and a process.

4. Why can groundwater levels change after storms while coal deposits cannot be replaced on that timescale? Use evidence about how each resource forms.

3 YOUR TURN

Your own words

At a new site, cracked rock near an ancient volcano lies beside a sandstone hill that reaches the surface and receives rain. In four sentences, propose where to search for copper and where to search for groundwater; use a clue and a geoscience process to explain each choice.

ANSWER KEY

Where Resources Gather

GRADE 6 · 6.5.d

PART 1 · READ AND MARK

Underline one observation about where each resource is found. Circle a process that explains each observation, then number each matching pair 1, 2, and 3. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why is copper more likely on the ridge than in the valley sand? Use a field observation and a process from the passage.	**The team found copper-rich rock in cracks near the ancient volcano but little copper in the valley sand. Hot water carried dissolved minerals through the cracks, where copper minerals settled out as the water cooled.**
2	Why do drill cores show coal on only one side of the valley? Connect the core evidence to how coal forms.	**Cores show coal on one side and none on the other. An ancient swamp covered only part of the region, and buried swamp plants changed into coal under heat and pressure over millions of years.**
3	Why do wells in sandstone yield more groundwater than wells in the ridge rock? Use rock evidence and a process.	**Rain enters the sandstone where it reaches the surface and moves through connected spaces between its grains. The ridge rock is solid and uncracked, so its wells yield much less water.**
4	Why can groundwater levels change after storms while coal deposits cannot be replaced on that timescale? Use evidence about how each resource forms.	**Rain renews groundwater, and the team measured water-level changes after storms. Coal forms when buried plant remains change under heat and pressure over millions of years.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would search for copper in the cracked rock near the ancient volcano. Hot, mineral-rich water could have flowed through the cracks and left copper minerals as it cooled. I would search for groundwater in the sandstone hill. Rain can soak in where the sandstone reaches the surface and collect in spaces between its grains.

Accept explanations that connect each resource's location to both passage evidence and a geoscience process. For Your Turn, accept other plausible search locations if the student supports both choices with the new site's clues and relevant processes.