

Fixing Marisol's Exit Ticket: Where the Resource Ideas Go Wrong

Learning target: I can find the errors in another student's explanations about natural resources, explain what went wrong, and rewrite each statement so it is accurate.

Error analysis

About 35 min

Individual

MS-ESS3-1 · practice

writing

independent practice

discussion

Name _____

Date _____

Period _____

Directions

Marisol is a fictional student who wrote the seven statements below on an exit ticket at the end of this lesson. Some are correct, some are partly correct, and some are wrong. Your job is to be the teacher. In Part A, judge each statement. In Part B, rewrite the ones that need fixing so that every word is accurate; keep anything that was right. In Part C, look for the pattern behind her mistakes. Do not just write 'wrong'; always say what the correct idea is and why.

You will need: This worksheet, Pencil

Marisol's exit ticket (fictional student work) — 1. A renewable resource is one that can never run out, like groundwater and trees. 2. Petroleum is found under places where lots of fish and plankton live today, because oil comes from sea creatures. 3. Copper ore forms where magma above a subduction zone releases hot fluids that cool in cracks, so copper mines are found near present or past plate boundaries. 4. As sediment piles up on buried sea creatures, the pressure makes them hot, and that heat turns them into oil. 5. Soil is renewable because it is always there; farming can wear it out for a while, but it comes right back. 6. Geothermal energy is renewable, but a plant uses it sustainably only if it puts the cooled water back and does not pump hot water out faster than the rock can reheat it. 7. All groundwater is nonrenewable, so a town should never use wells.

Part A: Judge each statement

1. Complete the table for all seven statements. Be precise in the middle column: quote the exact words that cause the problem.

Correct, partly correct, or wrong?	The specific words that are wrong (or 'none')	The accurate idea in a few words
Statement 1		
Statement 2		
Statement 3		
Statement 4		
Statement 5		
Statement 6		
Statement 7		

Part B: Rewrite the ones that need it

Rewrite each statement below so it is fully accurate. Keep Marisol's correct parts. Each rewrite should be one to three sentences and should include the reason, not just the corrected claim.

2. Rewrite statement 1. Your version must say what decides whether a resource is renewable, explain why a renewable resource can still run short, and say something true about groundwater and about trees.

3. Rewrite statement 2. Keep the true part (oil does come from sea organisms). Fix the part about *where* and *when*.

4. Rewrite statement 4. What really raises the temperature of buried remains, and what does the pressure do?

5. Rewrite statement 5. Your version must say how soil forms, roughly how long it takes, and what that means for a farm that loses its topsoil.

6. Rewrite statement 7. Keep the kernel of truth (some groundwater is being used up) and fix the words 'all' and 'never'. Use the words **recharge** or **replenish** in your rewrite.

Part C: Find the pattern

7. Statements 1, 5 and 7 all make the same kind of mistake, even though one calls things renewable and another calls things nonrenewable. Describe the mistake in one sentence, then explain how statement 6 (which is correct) avoids it.

8. Statements 2 and 4 make a different kind of mistake: both are about *how* and *when* a resource forms. Describe what Marisol has mixed up, and say why getting the 'when' right matters for predicting where oil is found.

9. Write one sentence of feedback you would give Marisol that would help her with all seven statements at once.

Three test questions

For any statement about renewable or nonrenewable, ask two questions: 'How long does nature take to replace this, compared with a human lifetime?' (that decides the label) and 'Are people using it faster than nature replaces it?' (that decides whether the use is sustainable). A statement that mixes the two, or skips the first, is at least partly wrong. For any statement about where a resource forms, ask: 'Is this about today's conditions or about conditions millions of years ago?' Oil, copper ore and most deep groundwater were made by past conditions. For any statement with 'always', 'never' or 'all', ask: 'Can I think of one exception from the lesson?' A shallow aquifer that refills every spring is the exception to statement 7.

Write the trap statements

Write three new statements about this lesson's resources that are *almost* right: each should contain one tempting error of the same two kinds found here (mixing up the renewable label with whether a use is sustainable, or confusing today's conditions with past processes). Trade with a partner and diagnose each other's statements. Then write a sentence explaining which kind of error was harder to spot and why you think that is.