

Fixing Marcus's Study Guide: Nine Claims About Synthetic Materials

Learning target: I can find the errors in a classmate's statements about natural resources, synthetic materials and biodegradability, explain exactly what went wrong, and rewrite each statement so that it is accurate.

Error analysis

About 40 min

Individual

MS-PS1-3 · practice

writing

independent practice

Name _____

Date _____

Period _____

Directions

Marcus wrote a study guide for this chapter and asked you to check it. Three of his nine statements are correct and six are not. In Part A, mark each statement and name in a few words the word or idea that went wrong. In Part B, for each incorrect statement, explain what Marcus was probably thinking, why it is wrong, and rewrite the statement so that it is accurate; keep his idea where it was partly right. Be fair to Marcus: most of his mistakes start from something true.

You will need: This worksheet, Pencil

Marcus's study guide (copied exactly) — **1.** Synthetic materials are made out of chemicals, not out of anything from nature. **2.** The safest choice is always the natural one: natural materials are safe and synthetic ones are harmful. **3.** Petroleum formed underground over hundreds of years, which is why we are running out. **4.** Corn ethanol is renewable because corn grows back every year, so switching from gasoline to ethanol has no downsides. **5.** A sapphire grown in a lab is a synthetic material even though it is the same substance as a sapphire dug from a mine. **6.** PLA cups are made from corn, so they are biodegradable and will break down in any trash can. **7.** Making the cancer drug paclitaxel from yew needles instead of yew bark was better because the needles grow back and the tree stays alive. **8.** Engineers decided in the beginning that plastics should be strong and cheap, and those requirements have never changed. **9.** Sucralose tastes sweet because its molecule is shaped almost like a sugar molecule, but the body cannot digest it, so it gives no energy.

Part A: Diagnose

1. Complete the table. For each incorrect statement, name in a few words the word or idea Marcus got wrong. For each correct statement, write 'correct' in the second column.

Correct or incorrect?	The word or idea that went wrong (a few words)
Statement 1	
Statement 2	
Statement 3	
Statement 4	
Statement 5	
Statement 6	
Statement 7	
Statement 8	
Statement 9	

Part B: Explain and rewrite

For each incorrect statement write three things: (a) **What Marcus was thinking:** the true idea or everyday meaning his statement started from. (b) **What went wrong:** the specific error, with a fact from the chapter that shows it is wrong. (c) **Rewrite:** the statement corrected, in one or two sentences, keeping any part that was right.

2. Statement 1 (synthetic materials are made of chemicals, not anything from nature).

3. Statement 2 (natural is safe, synthetic is harmful).

4. Statement 3 (petroleum formed over hundreds of years).

5. Statement 4 (corn ethanol is renewable, so switching has no downsides).

6. Statement 6 (PLA cups are made from corn, so they break down in any trash can).

7. Statement 8 (the requirements for plastics have never changed).

Part C: Step back

8. Statements 5, 7 and 9 are correct. For statement 7, add one sentence Marcus left out that would make the story complete: what did chemists still have to do to the substance from the needles, and what newer method has replaced harvesting trees for some manufacturers?

9. Four of Marcus's errors (statements 1, 2, 4 and 6) come from the same habit of thinking. Describe that habit in one sentence, then write a one-sentence rule Marcus could use to avoid it in the future.

Start from the true part

Every wrong statement on this sheet grew from something true. Statement 1 is right that synthetic materials are made by chemistry. Statement 4 is right that corn regrows every year. Statement 6 is right that PLA is made from corn and that it is biodegradable. For each one, write the true part first, then ask: what extra claim did Marcus tack on that the chapter does not support? Your rewrite is usually the true part plus the correct version of the extra claim.

Write the tenth statement

Write a tenth statement for Marcus's guide that is wrong in a way no statement on this sheet already covers, based on something in the chapter (for example, about medicines, gasoline, food additives or cost as a criterion). Trade with a partner and diagnose each other's statement using the Part B format. The best wrong statements, like Marcus's, start from something true.